Vol. VI August, 1934 No. 1-b

# BULLETIN

OF

## The New York State College of Forestry

AT

## SYRACUSE UNIVERSITY

SAMUEL N. SPRING, Dean

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Technical Publication No. 41

# THE POLYPORACEAE OF NEW YORK STATE

## (Pileate Species)

BY

JOSIAH L. LOWE

Issued jointly by the Department of Forest Botany and Pathology, New York State College of Forestry, and the Department of Botany and University Herbarium of the University of Michigan (No. 409)

Published quarterly by the New York State College of Forestry at Syracuse, New York. Entered as second-class matter October 18, 1927, at the Post Office at Syracuse, New York, under the Act of August 24, 1912

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# CONTENTS


PAGE

INTRODUCTION ..... 7

DESCRIPTIONS AND KEYS

Polyporaceae ..... 14

Polyporus ..... 15

Melanopus ..... 24

Spongiosus (white) ..... 30

Petaloides ..... 32

Lentus ..... 35

Ovinus ..... 37

Merismus ..... 40

Pelloporus ..... 43

Spongiosus (brown) ..... 46

Apus ..... 48

Favolus ..... 90

Trametes ..... 91

Daedalea ..... 101

Lenzites ..... 106

Cyclomyces ..... 109

Fomes ..... 109

Ganoderma ..... 125

GLOSSARY ..... 127

LITERATURE CITED ..... 132

INDEX ..... 133

SYNOPTICAL ARRANGEMENT OF THE GENERA AND SPECIES ..... 138

## ILLUSTRATIONS

The illustrations figure the more common morphological terms and structures used to characterize and separate the species of polypores.

PAGE

I. MACROSCOPIC CHARACTERS ..... 10

II. MICROSCOPIC CHARACTERS ..... 12

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# THE POLYPORACEAE OF NEW YORK STATE

## (Pileate Species)

by

JOSIAH L. LOWE

The Polyporaceae include for the most part species of fungi saprophytic or parasitic upon wood. Consequently the polypores are among the chief causal agents in the decay of the wood of living and dead trees and of manufactured stock.

The following manual is a conservative treatment of the species of polypores known to occur within the state or to have been found near the borders of the state. The basis for these records has been an examination of the specimens of polypores deposited in the herbaria of the following institutions: New York State Museum (SM)[1], Albany, N. Y.; New York Botanical Garden (NYBG), New York, N. Y.; Cornell University (CU), Ithaca, N. Y.; New York State College of Forestry (CF), Syracuse, N. Y.; Buffalo Museum of Natural Science (BM), Buffalo, N. Y.; and the Herbarium of the University of Michigan (MU), Ann Arbor, Mich. Mycological and pathological literature were also examined.

The notes following the descriptions of each species are based upon the records accompanying the specimens in the herbaria, supplemented by the literature records and the writer's field experience. The common names of the substrata have been made to conform, as far as possible, with those given in the Seventh Edition of Gray's New Manual of Botany.

The pathological literature cited after most of the species is not intended to be exhaustive, but rather to represent selected articles which, in addition to a treatment of the subject, give a good bibliography. The list of illustrations likewise represents a selection on the part of the writer.

### Acknowledgments

This study was suggested by Dr. L. H. Pennington, late head of the Department of Forest Botany at the New York State College of Forestry. He, until his death, directed the investigation. Thanks are due Dr. H. F. A. Meier, present head, for permission

[1] The abbreviations are those used in the text to indicate that there was found during September, 1931, in the herbaria listed one or more specimens collected in New York State. The specimens in the Lloyd Mycological Collection at Washington, D. C. were not examined, but records of collections as published by Lloyd in his Mycological Notes and Letters, and presumably represented by specimens in the Lloyd Mycological Collection, are indicated by the abbreviation (LM).

to use the facilities of the Department during the summer of 1931, and to Dr. R. R. Hirt for assistance and advice, especially in the preparation of the manuscript.

A large part of the study was done at the University of Michigan, and acknowledgments are made to the following men in the Departments of Botany at that institution: Dr. E. B. Mains, Director of the University Herbarium, for aid in the preparation of the manuscript and for permission to use the facilities of the herbarium and library; Dr. L. E. Wehmeyer for aid in the preparation of the manuscript; and Dr. D. V. Baxter, of the School of Forestry, for aid in the preparation of the manuscript and for critical advice concerning the interpretation and disposition of certain species.

Acknowledgments are made to Dr. John R. Stevenson, Curator of the Lloyd Herbarium, Smithsonian Institution, Washington, D. C., for examining records with certain specimens in the Lloyd Herbarium, and to Dr. L. O. Overholts, Pennsylvania State College, State College, Pa., for identifying specimens and for aid and advice concerning certain difficult and imperfectly understood species.

Acknowledgments are made for the privilege of studying specimens to the following directors of herbaria: Dr. H. D. House, New York State Museum; Dr. Fred J. Seaver, New York Botanical Garden; Dr. H. M. Fitzpatrick, Cornell University; and Mr. Charles Zenkert, Buffalo Museum of Natural Science.

## Methods

Macroscopic examinations were made with the aid of a small hand lens (14x). Microscopic data were obtained from free hand sections cut with a sectioning razor and mounted in three percent potassium hydroxide (KOH) solution, which causes the spores and other structures to swell to approximately normal size. Dried specimens were sometimes quickly softened by applying alcohol followed by water; in most cases however, the sections were made from unsoftened material. Hyphal characters were obtained by teasing thin sections of the context with needles, and hymenial characters from either longitudinal or cross sections of the tubes.

## Morphology and Classification

Genera are distinguished by the character of the pore surface, the annual or perennial nature, the resupinate or pileate habit of the fruiting body, the spore character, or by the internal structure of the fruiting body.

The presence or absence of a stem, the color of the context, the nature of the surface of the pileus, the pore size, and the size and shape of the spores are the most important characters used to separate species.

In the genus Polyporus the consistency of the fruiting body in the fresh condition is an important diagnostic character. There is no hard and fast rule by which this may be determined from a dried specimen. In general, however, extremely fleshy species dry very hard and brittle, spongy species dry more or less punky or corky, and coriaceous species dry unchanged in consistency, or become slightly more rigid.

In a small section of the genus Polyporus the color or consistency of the context differs markedly from that of the tubes. Sometimes certain species in other sections of the genus apparently show this character upon drying. In longitudinal section, however, the color of the tubes changes gradually at the juncture of the tubes and the context, while in the species truly belonging to this group the color changes abruptly.

Cystidia are restricted to species with white or brightly colored context, with the exception of *Polyporus Schweinitzii*, which has a brown context. Setae are restricted to species with brown context.

The spores of the species with white or brightly colored context are hyaline. The spores of the species with brown context may be either hyaline or colored. When hyaline, the spores are often difficult to demonstrate; when brown they are usually very abundant.

The illustrations figure the more common morphological terms and structures used to characterize and separate the species of polypores.

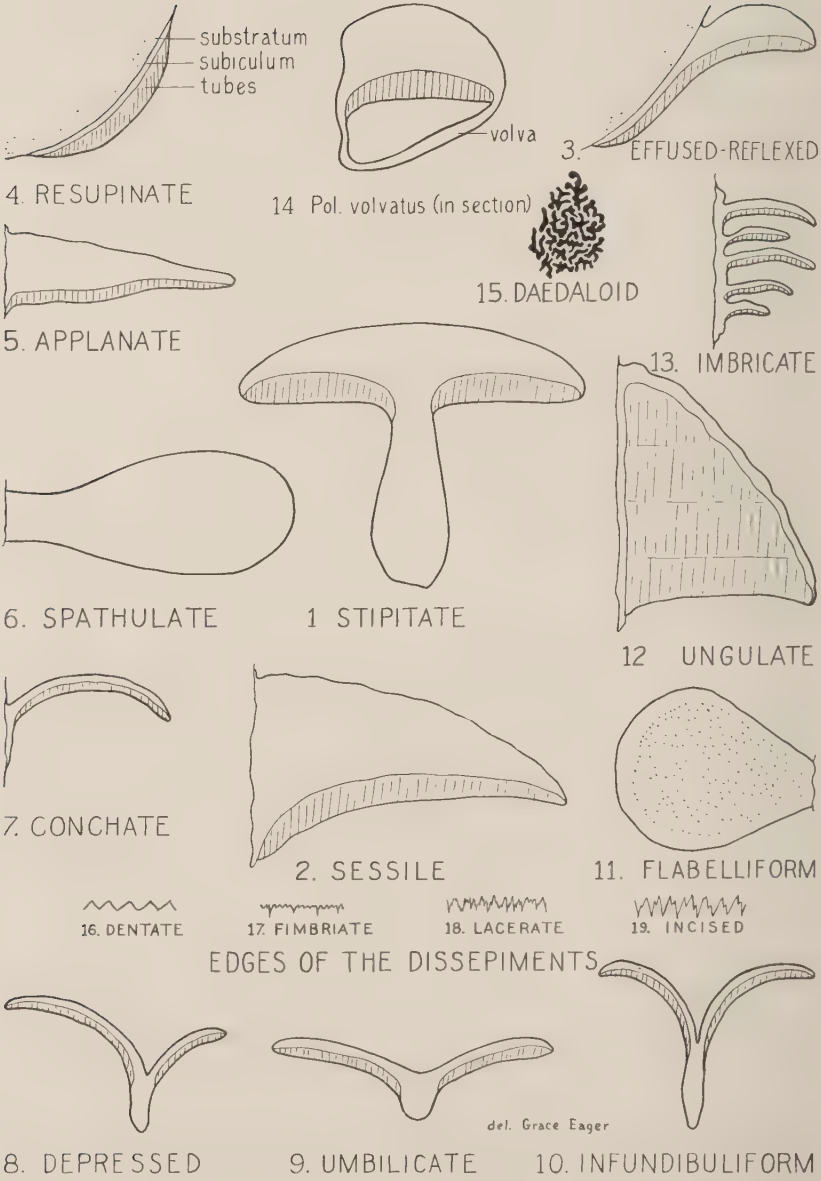
Many species of polypores appear to be restricted to certain kinds of substrata and this specialization is most marked between coniferous and deciduous substrata. This fact is often of considerable aid in eliminating species closely related to the one in hand. The most common species are less specialized and may occur upon a substratum of either deciduous or coniferous wood, though always much more abundantly upon the one or the other.

The artificial key is based upon the more prominent characters of the species, little or no regard being paid to their natural relationships. The text key (abstracted in the synoptical key on page 138) is, on the other hand, a natural key and is based upon characters least altered by accidental conditions of growth. The text key is continued to the species in the single or double line of italic type at the beginning of the description of each species. Two distinct keys to the species are thus available. The text key should be of particular value for specimens abnormal in form, size, or other characters.

The synonomy is limited to species reported for New York State and further to those species the synonomy of which the writer has determined by an examination of types or other authentic specimens. Probable synonyms, omitted species, and misdeterminations are discussed under OBSERVATIONS which follow the specific descriptions under each genus.

If the species does not appear to be described in this work the manuals listed under "Literature Cited" should be consulted.

## ILLUSTRATION I



## ILLUSTRATION I

### Macroscopic Characters

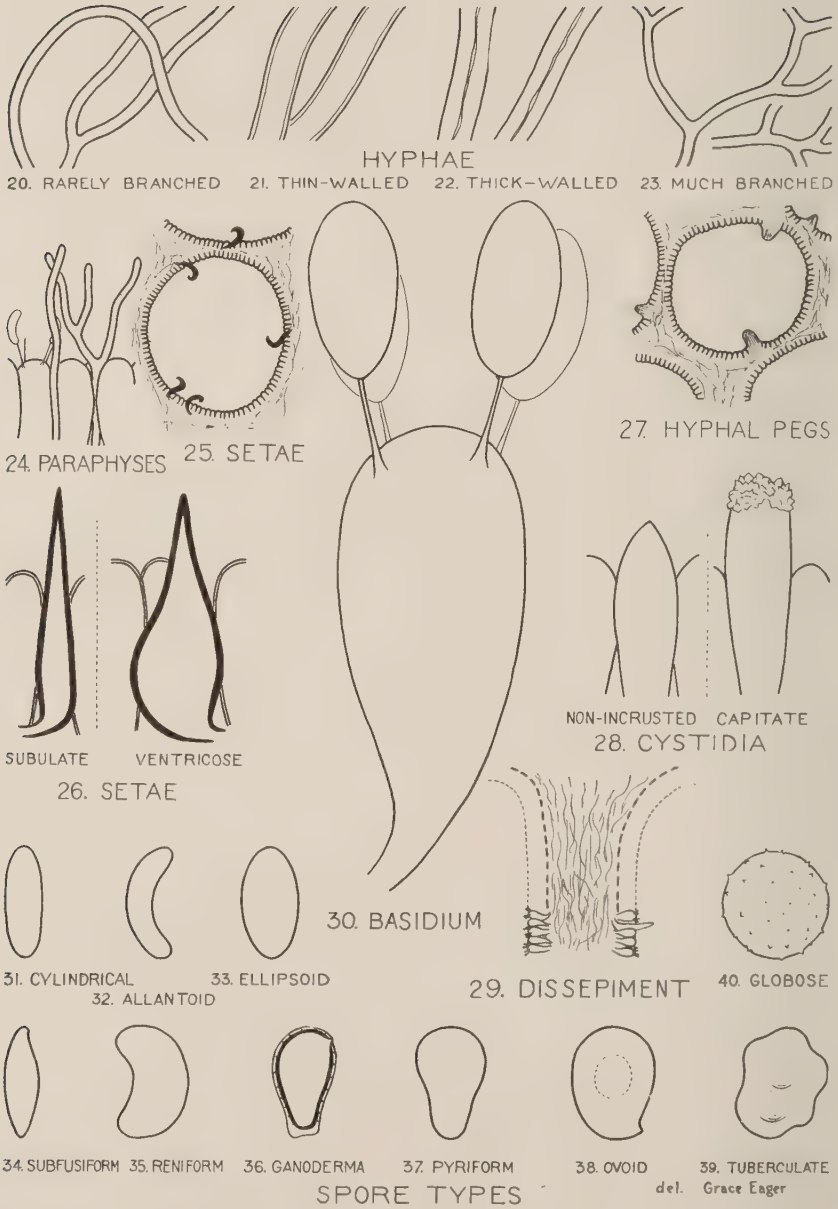
1–14. Habit of various types of fruiting bodies in section, with the exception of No. 6, a view from the upper side, and No. 11, a view from the lower side, the margin sterile below.

12. Stratification of the tubes, typical of the perennial species in the genus Fomes.

15. Daedaloid pore surface.

16–19. Self explanatory.

# ILLUSTRATION II



## ILLUSTRATION II

### Microscopic Characters

Self explanatory with the exception of:

24. Branched and simple paraphyses.

25. Setae of *Polyporus dualis.*

29. Cross section of a dissepiment near the upper end of the tubes. The hymenium lines the walls of the tubes; between the hymenia is the tramal tissue which grades into the context above.

31–40. Surface view (except No. 36) of spores of various types as they appear under the microscope.

36. Type of spore characteristic of the genus Ganoderma. The spines project from the inner wall into or slightly through the outer wall. The apex of the spore is truncate.

38. Spore with a single guttule and with an apiculus.

39. Spore of *Polyporus griseus.*

40. Spore wall echinulate.

## Descriptions and Keys

### POLYPORACEAE

Fruiting body annual or perennial, stipitate, sessile, effused-reflexed, or resupinate, fleshy, coriaceous, corky, or woody; context white, bright colored, or brown; hymenium typically lining tubes throughout their length but not continuous over the edges of the dissepiments, more rarely the hymenium covering lamellae or teethlike projections; tubes coherent, when fresh usually not readily separating from the context; hymenophore (except in *P. volvatus*) exposed from the first, not covered with a volva; basidia non-septate; basidiospores hyaline or colored.

The family as defined above is in its more limited sense, following Overholts (**8**) and Shope (**15**). The Polyporaceae connect with the Boletaceae through certain fleshy species of Polyporus, particularly of the section Ovinus, with the Agaricaceae through species of Lenzites, and with the Hydnaceae through certain species such as *Polyporus tulipiferus*.

#### KEY TO THE GENERA

1. Fruiting body entirely resupinate ..... *Poria*[1]
   Fruiting body effused-reflexed, sessile, or stipitate, rarely resupinate.. 2
2. Fruiting body perennial, the tubes arranged in layers or strata ..... *Fomes* (p. 109)
   Fruiting body annual or sometimes persisting for two or three years, but not typically perennial ..... 3
3. Pore surface composed of concentric lamellae; pileus stipitate; spores brown ..... *Cyclomyces* (p. 109)
   Pore surface composed of radiating lamellae or gills.. *Lenzites* (p. 106)
   Pore surface poroid, the pores circular, angular, or irregularly elongated, but not lamellate ..... 4
4. Tramal tissue not distinct from the context, the tubes often sunken to uneven distances into the context ..... 5
   Tramal tissue distinct from the context, the tubes usually sunken to even distances into the context ..... 7
5. Pores typically daedaloid ..... *Daedalea* (p. 101)
   Pores usually radially elongated and often breaking up to form lamellae ..... *Lenzites* (p. 106)
   Pores typically circular to angular, sometimes in age becoming more or less daedaloid ..... 6
6. Tubes often sunken to uneven depths into the context.. *Trametes* (p. 91)
   Tubes usually sunken to even depths into the context.. *Polyporus* (p. 15)
7. Surface of the pileus with a thin reddish or yellowish crust, laccate; spores appearing echinulate, usually truncate at one end ..... *Ganoderma* (p. 125)
   Surface not laccate; spores usually smooth, if echinulate, then globose. 8
8. Pores circular to angular, sometimes becoming somewhat sinuous with age, rarely radially elongated; pileus stipitate, sessile, or effused-reflexed ..... *Polyporus* (p. 15)
   Pores usually radially elongated, angular; pileus typically laterally stipitate ..... *Favolus* (p. 90)

---

[1] Not treated in this manual. For a key to the white and bright-colored porias see Baxter in Papers Michigan Acad. Sci., Arts, Lett. 15:195–211. 1932; for a key to the brown porias see Baxter in the same, vol. 17:424–431. 1933, and Overholts in Mycologia 23:125 126. 1931. See also Overholts' studies on American porias in N.Y.S. Mus. Bull. 205–206:67–166. 1919, in Mycologia 14:1–11. 1922 and 15:207–232. 1923, and in Bull. Torrey Bot. Club 50:245–253. 1923; and Baxter in Papers Michigan Acad. Sci., Arts, Lett. 19:395–332. 1934.

In his most recent paper Overholts (**16**, p. 8) includes the genera Merulius and Solenia in the Polyporaceae. For a key to the species in these genera see Burt in Ann. Missouri Bot. Gard. 4:305–362. 1917 (Merulius), vol. 6:143–145. 1919 (supplement to Merulius), and vol. 11:13–26. 1924 (Solenia).

**POLYPORUS** (Mich.) Fries

Fruiting body annual, rarely persisting for two or three years, terrestrial or epixylous, sessile, effused-reflexed, sometimes resupinate, or stipitate and upright, rarely pendant, fleshy, coriaceous, or corky to woody; context white, yellow, reddish, or brown; trama usually sharply distinct from the context, or sometimes more or less continuous with it; pore mouths typically circular to angular, occasionally sinuous to daedaloid, rarely somewhat lamellate, the dissepiments sometimes splitting to form teeth; cystidia or setae present or absent; spores hyaline or colored.

A strict definition cannot be given of a genus so large and variable as Polyporus. Difficulty may be experienced in distinguishing between Polyporus and Trametes, and there is no real distinction. In practice the differentiation is often based upon the consistency of the context, a character difficult to describe. The hymenial configuration approaches that of Daedalea in some species, of Lenzites in others. Favolus usually can be distinguished by the lateral attachment of the stem.

Numerous attempts have been made to break up the genus Polyporus into smaller, more workable genera, but no generally satisfactory divisions as yet have been devised. The sectional names here used are those employed by Lloyd, and for these species they offer a workable means of separation.

KEY TO THE SPECIES

1. Fruiting body stipitate or substipitate....2 (SECTION I)
   Fruiting body sessile or effused-reflexed, rarely resupinate.... 46 (SECTION II)

SECTION I: FRUITING BODY STIPITATE OR SUBSTIPITATE

2. Context white, whitish, yellowish, or pinkish....3 (Subsection 1)
   Context light brown to yellowish brown or darker...38 (Subsection 2)

Subsection 1: Context white or light colored

3. Stem not black at the base nor black throughout, white to brown and more or less concolorous throughout.... 4
   Stem black at the base, or black throughout.... 6
4. Stem normally unbranched, sometimes branching once or twice but not repeatedly branched.... 5
   Stem short and thick, branching and giving rise to a few large or many small fleshy pilei.... 35
5. Stem lateral, or fruiting body pendant.... 14
   Stem central or excentric, or irregular, rarely truly lateral; fruiting body upright.... 26

I. Stem black at the base

6. Surface of the pileus with large appressed scales; pores large, 1–2.5 mm. broad; stem usually lateral; spores 12–16 x 4.5–6 $\mu$, 8. *P. squamosus*
   Surface entirely without scales, or with very small scales; pores usually smaller.... 7
7. Surface of the pileus pure white when fresh, remaining white or discoloring somewhat in age.... 8
   Surface more or less yellowish or orange, or varying to almost black, never pure white.... 9

8. Pilei rather small, 2.5–5 cm. broad, 0.5–1 cm. thick.....*2. P. albiceps*
Pilei larger, 10–15 cm. broad, 1–3 cm. thick .....*1. P. admirabilis*
9. Pores 2–3 per mm.; spores 6–8 $\mu$ wide; pileus fleshy-tough when fresh, fragile when dry, the surface fibrillose-scaly to squamulose or minutely scabrous.....*7. P. radicatus*
Pores 1-2 per mm., or larger; spores 4 5.5 $\mu$ wide; pileus fleshy-tough when fresh, fragile when dry, the surface smooth or with minute tufts of innate fibrils ..... 10
Pores 3–4 per mm. or smaller; spores 2–4 $\mu$ wide; pileus leathery or fleshy-tough when fresh, drying rather rigid and brittle, the surface smooth or nearly so..... 11
10. Surface of the pileus entirely without scales; pores about 1 mm. wide .....*8a. P. pennsylvanicus*
Surface usually with tufts of small innate fibrils; pores 1–2 per mm. .....*8b. P. fagicola*
11. Surface of the pileus varying from pale ochraceous to light reddish brown ..... 12
Surface brown to almost black, at least in the center, and in mature specimens ..... 13
12. Surface with distinct radial markings in the form of radial striations or fine fibrils.....*3. P. varius*
Surface without any radial markings, or with very faint markings .....*4. P. elegans*
13. Pores 3–4 per mm.; growing on the ground attached to buried wood .....*6. P. melanopus*
Pores 6–8 per mm.; growing on logs and stumps.....*5. P. picipes*

II. Stem not black at the base

A. Stem unbranched, lateral

14. Fruiting body small, not exceeding 1 cm. in any dimension; often pendant ..... 15
Fruiting body usually much larger; very rarely pendant..... 16
15. Surface of the pileus brownish or whitened-pruinose; edges of the dissepiments much thickened; on deciduous wood.....*15. P. pocula*
Surface white or whitish; edges of the dissepiments thin; on coniferous wood .....*16. P. subpendulus*
16. Margin of the pileus thick, projecting beyond the pore surface as a wide sterile band; pileus with a thin but distinct pellicle; on birch trees.....*12. P. betulinus*
Margin projecting little if at all beyond the pore surface; on various substrata ..... 17
17. Context usually 3 mm. or more thick; pilei usually rather large.... 18
Context usually not over 2 mm. thick; pilei usually rather small.. 20
18. Context duplex; surface of the pileus villose-tomentose to almost glabrous; cystidia usually present; about stumps or trunks of deciduous trees .....*10. P. distortus*
Context usually duplex; surface coarsely hispid to tomentose or fibrillose; cystidia present; on coniferous wood.....*80. P. borealis*
Context homogeneous; on coniferous wood; cystidia absent..... 19
19. Surface of the pileus minutely hispid; pores averaging about 2 per mm.; context drying rather hard; spores subfusiform, 12 16 x 4–6 $\mu$ .....*14. P. hirtus*
Surface minutely tomentose to nearly glabrous; pores 4 6 per mm.; context drying bone hard; spores cylindrical, 4–7 x 2–2.5 $\mu$, *13. P. osseus*
20. Context duplex; pores 4–5 per mm .....*9. P. humilis*
Context homogeneous ..... 21
21. Pores 2–3 per mm. or larger, usually radially elongated..... 22
Pores 3–5 per mm. or smaller..... 23

22. Pores 0.5 mm. or more wide; tubes not waxy when fresh; hyphae 2.5–4 $\mu$ in diameter; spores 8–11 x 3–4 $\mu$...See *99. Favolus alveolaris*
Pores 2–3 per mm.; tubes more or less waxy when fresh; hyphae 5–8 $\mu$ in diameter; spores 3.5–5 x 2–2.5 $\mu$.....*59. P. rhipidium*
23. Spores 6–7.5 x 1.5–2 $\mu$; pileus usually bearing a small cup-shaped sterile structure at the base on the upper side; surface white to yellowish; usually on elm branches.....*69. P. conchifer*
Spores 2.5–5 x 2–3 $\mu$; a sterile cup-shaped structure never present; on wood of deciduous or coniferous trees..... 24
24. Cystidia present; on coniferous wood.....*74. P. balsameus*
Cystidia none; on coniferous or deciduous wood..... 25
25. Surface of the pileus more or less yellowish and cartilaginous when dry; on deciduous wood.....*72. P. semisupinus*
Surface white, grayish, or brownish, not becoming cartilaginous-appearing; usually on coniferous wood.....*73. P. floriformis*

B. Stem unbranched, central or excentric

1. Pileus fleshy-tough to leathery

26. Spores 11–15 x 4–5.5 $\mu$; pileus drying fragile..... 27
Spores 6–9.5 x 2–3 $\mu$, or smaller; pileus drying rigid and brittle.. 28
27. Surface of the pileus entirely without scales; pores usually about 1 mm. wide .....*8a. P. pennsylvanicus*
Surface with tufts of small innate fibrils; pores 1–2 per mm., *8b. P. fagicola*
28. Context not over 2 mm. thick..... 29
Context 2 mm. or more thick, usually much more..... 31
29. Surface more or less yellow, varying to brownish when dry, nearly glabrous; spores ovoid to subglobose, 3–3.5 x 2.5 $\mu$...*17. P. Peckianus*
Surface light brown to yellowish brown or darker, hispid to glabrous; spores cylindrical to cylindric-ellipsoid, 6–9.5 x 2–3 $\mu$.. 30
30. Pores 1–2 per mm.; surface squamulose, hispid-tomentose to glabrous; fruiting in the spring.....*18. P. arcularius*
Pores 2–3 per mm.; surface minutely hispid to glabrous; fruiting in the summer and fall.....*19. P. brumalis*
31. Fruiting body fleshy-tough to leathery when fresh; usually epixylous 32
Fruiting body fleshy when fresh, terrestrial..... 33
32. Context duplex; spores ellipsoid to ovoid, 5–7 x 3.5–5 $\mu$..*10. P. distortus*
Context homogeneous; spores cylindrical to cylindric-ellipsoid; pileus large, 10–15 cm. broad, 1–3 cm. thick.....*1. P. admirabilis*
Context homogeneous; pileus smaller, 2.5–5 cm. broad, 0.5–1 cm. thick .....*2. P. albiceps*

2. Pileus fleshy

33. Spores coarsely tubercular; context rosy gray when fresh; surface of the pileus grayish to bluish-gray or darker.....*20. P. griseus*
Spores smooth; surface of the pileus bright violaceous, blue, or smoky indigo when fresh, drying bluish black or grayish blue, *21. P. caeruleoporus*
Spores smooth; surface more or less yellowish green or yellowish brown; context usually yellow when dry.....*24. P. cristatus*
Spores smooth; surface white to brownish when fresh, often becoming dark colored or reddish on drying..... 34
34. Pilei solitary; surface of the pileus usually darkening or becoming black spotted when dry; context pinkish or blackish when dry, often with a black line adjacent to the tubes.....*22. P. ovinus*
Pilei caespitose, rarely solitary; surface usually turning more or less reddish on drying; context usually drying pinkish, often with a reddish layer adjacent to the tubes.....*23. P. confluens*

C. Stem few to many times branched

35. Pilei many, 1–4 cm. broad, centrally attached.....*25. P. umbellatus*
Pilei many, 2–7 cm. broad, laterally attached.....*26. P. frondosus*
Pilei few, usually 5 cm. or more broad, centrally to laterally attached ..... 36
36. Tubes bright sulphur yellow, rarely white; pores 3–4 per mm.; spores smooth.....*29. P. sulphureus*
Tubes white; pores 0.5–2 mm. broad; spores echinulate..*28. P. Berkeleyi*
Tubes white; pores 2–3 per mm. or smaller; spores smooth..... 37
37. Pores 5–7 per mm.....*27. P. giganteus*
Pores 2–3 per mm.; context whitish to yellow when dry; surface of the pileus yellowish green or yellowish brown.....*24. P. cristatus*
Pores 2–3 per mm.; context pinkish or reddish when dry; surface usually more or less reddish on drying.....*23. P. confluens*

Subsection 2: Context light brown or darker

38. Surface of the pileus with a thin crust; spores appearing echinulate 39
Surface without a crust; spores smooth..... 40
39. Crust varnished, bright red to almost black. See *144. Ganoderma lucidum*
Crust varnished, yellowish brown or more or less olivaceous, See *145. Ganoderma Curtisii*
Crust not varnished; pilei sessile or more often appearing substipitate; context dark brown, soft and punky.....See *142. Fomes lobatus*
40. Fruiting body pendant, small, up to 2.5 cm. broad; spores reddish brown .....*30. P. dependens*
Fruiting body erect, usually much larger; spores hyaline or brown. 41
41. Context very thin, 1 mm. or less thick..... 42
Context thicker, 1–5 mm. or more thick..... 43
42. Pores large, 1 mm. or more broad, rarely smaller; pileus dull above; hyphae often branched, 4–8 $\mu$ in diameter.....*33. P. focicola*
Pores smaller, 2–4 per mm.; pileus usually shiny silky-fibrillose; hyphae rarely branched, 6–12 $\mu$ in diameter; spores apiculate, without a guttule .....*32. P. cinnamomeus*
Pores 2–4 per mm.; pileus dull to subshiny; hyphae rarely branched, 4–6 $\mu$ in diameter; spores not apiculate but with a large guttule, *31. P. perennis*
43. Setae present; context duplex..... 44
Setae absent; context homogeneous..... 45
44. Pileus usually centrally or excentrically stipitate; setae usually straight; spores 4.5–5.5 x 3–4 $\mu$ .....*36. P. circinatus*
Pileus laterally stipitate with a short stem, or sessile; setae strongly curved; spores 6–7 x 4–5.5 $\mu$.....*37. P. dualis*
45. Pileus large, convex to umbonate or infundibuliform; spores hyaline; cystidia brown .....*35. P. Schweinitzii*
Pileus middle-sized, convex; spores brown; cystidia or setae absent, *34. P. Montagnei*

SECTION II: PILEUS SESSILE OR EFFUSED-REFLEXED (APUS)

46. Context white though sometimes becoming pallid or slightly brownish on drying..... 47
Context light brown to dark brown..... 50
Context bright colored, orange, reddish, pinkish, or yellowish..... 67
47. Margin of the pileus continuous with a volva which surrounds the pore surface.....*53. P. volvatus*
Volva never present..... 48
48. Tubes more or less smoke colored to almost black..... 72
Tubes more or less waxy when fresh, flesh colored to orange or brick red, or purplish black; or not waxy and yellowish or purplish.. 73
Tubes more or less concolorous with and of the same consistency as the context, at least where adjacent to the context..... 49

49. Pileus more or less coriaceous when fresh; context usually less than 5 mm. thick and often much thinner ..... 75
Pileus soft and watery, or firm, or fleshy-tough, when fresh; context thin or thick ..... 91

Subsection 1: Context light brown or darker

50. Fruiting body large, cylindrical, or ungulate to globose, with a central granular core ..... 51
Fruiting body conchate to applanate or convex, or sometimes more or less resupinate; context homogeneous throughout ..... 52
51. Fruiting body with a densely imbricate mass of small, closely overlapping pilei; spores hyaline ..... *47. P. graveolens*
Fruiting body imbricate with few large pilei, or pilei solitary; spores brown ..... *41. P. Rheades*
52. Trama and context with large imbedded setae-like bodies; spores greenish yellow in mass, yellowish under the microscope, *39. P. glomeratus*
Such setae-like bodies never present; true setae present though sometimes rare ..... 53
Such setae-like bodies never present; setae absent (in *P. Schweinitzii* brown cystidia present) ..... 58

I. Setae present

53. Spores hyaline or nearly so ..... 54
Spores brown ..... 57
54. Context duplex; spores ellipsoid to ovoid, 6–7 x 4–5.5 μ ... *37. P. dualis*
Context homogeneous; spores ovoid to globose, or cylindrical to ellipsoid ..... 55
55. Spores subglobose to globose, 4–5 μ; context 1–5 mm. thick; on coniferous wood ..... See *136. Fomes Pini*
Spores ovoid to subglobose, 7–8 x 5.5–7 μ; context 1.5–4 cm. thick; on deciduous wood, usually oak ..... *42. P. dryadeus*
Spores cylindrical to ellipsoid ..... 56
56. Pores 5–8 per mm.; hyphae 3–5 μ in diameter; setae abundant; on a variety of substrata ..... *43. P. gilvus*
Pores 4–5 per mm.; hyphae 4–7 μ; setae usually rare; usually on birch and alder ..... *44. P. radiatus*
Pores 2–4 per mm.; hyphae 2.5-3 μ; setae abundant, See *114. Trametes tenuis*
57. Spores 5.5–7.5 x 4–5.5 μ; hyphae 6–10 μ in diameter; on deciduous wood ..... *40. P. caticularis*
Spores 4–5 μ; hyphae 3–5 μ in diameter; on coniferous wood, See *136. Fomes Pini*

II. Setae absent

58. Surface of the pileus covered with a thin reddish or darker varnished crust; spores appearing echinulate ... See *146. Ganoderma sessile*
Surface covered with a thin yellowish brown or darker but not varnished crust; spores appearing echinulate. See *142. Fomes lobatus*
Surface without a crust; spores smooth ..... 59
59. Context 1 mm. or less thick ..... 60
Context 2–10 mm. or more thick ..... 61
60. Context yellowish brown; on burnt coniferous wood, See *112. Trametes carbonaria*
Context light brown; on deciduous wood ..... See *111. Trametes mollis*
61. Growing only on the wood of coniferous trees, or about coniferous stumps ..... 62
Growing only on the wood of deciduous trees ..... 63

62. Surface of the pileus strigose-tomentose to nearly glabrous; cystidia present, brown; spores ellipsoid to ovoid, 6–8 x 4–5 μ, *35. P. Schweinitzii*
Surface glabrous or nearly so; cystidia none; spores cylindrical to cylindric-ellipsoid, 8–12 x 2.5–5 μ.....See *113. Trametes odorata*
Surface minutely hispid or velvety-tomentose to glabrous, with dark bands; cystidia none; spores allantoid, 5–7 x 1–2 μ...*46. P. resinosus*
63. Surface of the pileus densely hirsute to hispid-tomentose or strigose 64
Surface minutely hispid or velvety to glabrous..... 65
64. Context 1–4 cm. thick, yellowish brown or darker; pores 2–4 per mm.; spores yellowish-brown.....*38. P. hispidus*
Context 0.2–1 cm. thick, light brown; pores averaging about 1 per mm.; spores hyaline.....See *109. Trametes hispida*
65. Context cinnamon to yellowish brown or darker, turning violaceous when touched with KOH solution; spores ellipsoid to ovoid, 2.5–4 x 2.5–3 μ.....*45. P. rutilans*
Context light brown, not turning violaceous with KOH solution; spores 5–10 μ long..... 66
66. Pores 4–6 per mm.; surface of the pileus cinnamon-brown to blackish brown, with darker bands; spores allantoid, 5–7 x 1–2 μ, *46. P. resinosus*
Pores 4–6 per mm.; surface white when fresh, becoming brownish on drying; spores ovoid to subglobose, 6–9 x 5.5–7 μ, *79. P. robiniophilus*
Pores 1.5–2 per mm.; surface light brown, sometimes darkening with age; spores cylindrical, 7–10 x 3–4 μ.....See *110. Trametes malicola*

Subsection 2: Context bright colored

67. Context pale buff when fresh, drying sordid flesh-color to dark red, hard, zonate; tubes often becoming blackish and agglutinate on drying .....*52. P. croceus*
Context light yellow, firm and fragile when dry; tubes usually bright sulphur yellow.....*29. P. sulphureus*
Context pinkish, or distinctly reddish, or some shade of orange in color ..... 68
68. Pores very large, 1–3 mm. or more broad, the dissepiments often splitting and becoming tooth-like; context very soft and spongy; spores 8–10 x 2.5–3.5 μ.....*51. P. alboluteus*
Pores 1–2 per mm.; edges of the pores not splitting though at times becoming lacerate; context spongy to firm corky; spores 5–7 x 3–4 μ.....*50. P. fibrillosus*
Pores 2–6 per mm.; context floccose-fibrous to corky..... 69
69. Pore surface cinnabar red..... 70
Pore surface whitish to flesh colored, or pinkish to rosy..... 71
70. Context 4 mm. or more thick.....*49. P. cinnabarinus*
Context not over 2.5 mm. thick.....*48. P. sanguineus*
71. Spores ovoid to subglobose, 6–7 x 5–6 μ; pileus more or less reddish; on the wood of deciduous trees.....See *131. Fomes fraxinicus*
Spores cylindrical or allantoid, 5–8 x 1.5–2.5 μ; pileus pinkish to rose colored, or in age grayish to black; usually on the wood of coniferous trees.....See *107. Trametes subrosea*

Subsection 3: Context white

I. Tubes of different color or consistency than the context

72. Tramal tissue brown in thin section under the microscope; surface radially appressed-fibrillose toward the margin, usually strigose at the base; margin crisped or wavy; pores 3–6 per mm., *54. P. crispus*

Tramal tissue brown in thin section; surface finely tomentose to short villous-tomentose; margin even; pores 6–8 per mm., *55. P. adustus*
Tramal tissue hyaline in thin section; surface finely tomentose to glabrous; pores 3–4 per mm. *56. P. fumosus*
73. Tubes bright sulphur yellow *29. P. sulphureus*
Tubes flesh colored to reddish purple or purplish black, easily separable from the context when fresh or moistened; pores 5–7 per mm. *58. P. dichrous*
Tubes pinkish to orange or brick red; pores 2–4 per mm. *57. P. amorphus*
Tubes more or less purplish in color, the dissepiments usually soon breaking up to form teeth; pores 2–4 per mm. 74
74. Growing only on the wood of coniferous trees *60. P. abietinus*
Usually growing on the wood of deciduous trees *61. P. pargamenus*

II. Tubes of the same color and consistency as the context

A. Pileus coriaceous (Polystictus type)

75. Context 1 mm. or less thick 76
Context 1 mm. or more thick 85
76. Dissepiments often breaking up to form teeth-like projections; cystidia present or absent 77
Dissepiments never breaking up to form teeth, though sometimes becoming torn; cystidia absent 79
77. Pileus surface slightly spongy-tomentose; cystidia absent; spores allantoid, 4–5 x 1.5–2 $\mu$ *71. P. undosus*
Pileus surface villous; cystidia present; spores 5–7 $\mu$ long; on coniferous wood *60. P. abietinus*
Pileus surface villous or velvety tomentose, or hirsute; cystidia present or absent; spores 5–6.5 $\mu$ long; usually on deciduous wood 78
78. Cystidia present, often incrusted at the tips; pileus up to 6 cm. broad; pore surface often violet tinted *61. P. pargamenus*
Cystidia present, usually incrusted throughout; pileus up to 1 cm. broad; pore surface white to yellowish *62. P. tulipiferus*
Cystidia absent; pileus up to 5 cm. broad; pore surface white or more often darkening, daedaloid, at least at the margin, See *119. Daedalea unicolor*
79. Surface of the pileus conspicuously velvety to strigose, distinctly zonate or somewhat azonate 80
Surface typically finely tomentose to glabrous, zonate or azonate 81
80. Surface distinctly zonate with many multicolored zones, villous or velvety *65. P. versicolor*
Surface indistinctly zonate, hirsute or strigose *64. P. hirsutulus*
81. Surface of the pileus brown 82
Surface white or yellowish 83
82. Pores 1–2 per mm.; usually on coniferous wood, See *101. Trametes variiformis*
Pores 2–3 per mm.; usually on coniferous wood, See *100. Trametes serialis*
Pores 5–6 per mm.; on deciduous wood *70. P. planellus*
83. Pores 1–3 mm. broad; on coniferous wood, See *102. Trametes heteromorpha*
Pores 1–2 per mm.; usually on deciduous wood, See *103. Trametes sepium*
Pores 3–4 per mm. or smaller 84
84. Pores 3–4 per mm.; pileus usually bearing a small sterile cup-shaped structure at the base on the upper side; spores 6–7.5 x 1.5–2 $\mu$ *69. P. conchifer*
Pores 4–8 per mm.; cup-shaped structure never present; spores 2.5–4 x 2–3 $\mu$ *72. P. semisupinus*

85. Dissepiments usually soon breaking up to form teeth; surface of pileus usually rough with appressed fibrils; cystidia none, *63. P. biformis*
Dissepiments usually soon breaking up to form teeth; surface villous; cystidia present ..... *62. P. tulipiferus*
Dissepiments not breaking up to form teeth, though the edges may become dentate or incised ..... 86
86. Surface of pileus tomentose or velvety to hirsute, zonate or azonate. 87
Surface finely tomentose to glabrous, if tomentose then azonate.... 89
87. Surface hirsute or tomentose; dissepiments usually thick and entire, *67. P. hirsutus*
Surface tomentose to velvety or villous or nearly glabrous, dissepiments usually thin and becoming dentate ..... 88
88. Pileus zonate with zones of different colors or shades, usually of buff or orange ..... *66. P. zonatus*
Pileus inconspicuously or not at all zonate, white to yellowish or ochraceous, rarely darker ..... *68. P. pubescens*
89. Spores allantoid, 3–4 x 1 $\mu$; pileus usually largely resupinate, reflexed up to 1.5 cm. wide ..... *85. P. semipileatus*
Spores broadly ellipsoid to ovoid, 3.5–5 x 2–2.5 $\mu$; pileus usually narrowed to a stem-like base, sometimes in the form of a rosette, imbricate ..... *73. P. floriformis*
Spores cylindrical to cylindric-ellipsoid, or slightly curved; pileus sessile or effused-reflexed, or resupinate ..... 90
90. Tubes separated from the context by a narrow dark line, often becoming more or less smoke colored on drying; on deciduous wood ..... *56. P. fumosus*
Dark line never present; tubes white; on deciduous wood, *68. P. pubescens*
Dark line never present; tubes white; on coniferous wood.. *93. P. anceps*

B. Pileus soft and watery, or more or less corky or fleshy-tough, when fresh

91. Fruiting body white to pale brownish when fresh, turning reddish or brownish where bruised, usually entirely turning color on drying ..... 92
Fruiting body when fresh not changing to reddish or brownish, sometimes changing to bluish or greenish, remaining concolorous or discoloring somewhat on drying ..... 95
92. Cystidia present ..... 93
Cystidia absent ..... 94
93. Surface of the pileus usually fibrillose; context 0.5–2 cm. thick; spores cylindrical to cylindric-ellipsoid, 8–10 x 2.5–3.5 $\mu$, *92. P. ursinus*
Surface subglabrous to appressed villose-tomentose; context 1–3 mm. thick; spores ellipsoid to ovoid, 3–5 x 2–3 $\mu$.... *74. P. balsameus*
94. Context 0.5–2.5 cm. thick; pileus sessile; spores allantoid, *90. P. mollis*
Context 0.2–1 cm. thick; pileus often effused-reflexed; spores cylindrical, occasionally allantoid ..... *91. P. fragilis*
95. Pileus surface cinnamon brown to blackish brown, with bands of darker color; context usually very light brown; spores allantoid, 5–7 x 1–2 $\mu$ ..... *46. P. resinosus*
Pileus surface white, grayish, or brownish, but not dark brown with zones; context white ..... 96
96. Spores reniform; on deciduous wood ..... *84. P. epileucus*
Spores allantoid or at least slightly curved ..... 97
Spores ellipsoid to subglobose ..... 101
Spores cylindrical to ellipsoid ..... 110

1. Spores allantoid

97. Fruiting body mostly resupinate; pileus up to 1.5 cm. broad; context not over 4 mm. thick ..... *85. P. semipileatus*
Fruiting body effused-reflexed or resupinate; pileus up to 7 mm. broad; context not over 1 mm. thick; margin conspicuously undulate ..... *71. P. undosus*
Fruiting body sessile or effused-reflexed; pileus usually more than 1.5 cm. broad; context 0.3–3 cm. thick; on deciduous or coniferous wood ..... 98
98. Tubes usually more or less bluish in color; spores bluish-gray in mass; surface of the pileus usually villous-pubescent or strigose, varying to nearly glabrous ..... *89. P. caesius*
Tubes never bluish in color; spores white in mass; surface glabrous to minutely pubescent or finely tomentose ..... 99
99. Surface of the pileus light brown or decidedly gray ... *88. P. tephroleucus*
Surface white or slightly grayish, often drying yellowish ..... 100
100. Surface with a thin pellicle that becomes more evident on drying, *86. P. albellus*
Surface lacking a pellicle ..... *87. P. lacteus*

2. Spores ellipsoid to subglobose

101. Cystidia present; context 1–3 mm. thick; pileus surface whitish to pale brownish, subglabrous, faintly zonate; on coniferous wood, *74. P. balsameus*
Cystidia absent; context 2 mm. or less thick ..... 102
Cystidia absent; context 2 mm. or more thick, usually much more .. 104
102. Pileus sessile; tubes long; on apple trees .. *77a. P. spumeus* var. *malicola*
Pileus often narrowed at the base and appearing substipitate; often in the form of a rosette; tubes short ..... 103
103. Surface white to grayish or brownish, not appearing cartilaginous when dry; pores 4–6 per mm ..... *73. P. floriformis*
Surface whitish to yellowish, appearing cartilaginous or resinous when dry; pores 4–8 per mm ..... *72. P. semisupinus*
104. Pores 1–3 per mm. or larger ..... 105
Pores 2–6 per mm ..... 107
105. Pores 1 mm. or more wide; pileus surface hirsute-tomentose to rarely glabrous; on deciduous wood ..... *82. P. obtusus*
Pores 1–3 per mm.; pileus surface coarsely hispid to tomentose or fibrillose; cystidia present; on coniferous wood ..... *80. P. borealis*
Pores 1–2 per mm.; pileus surface finely tomentose to glabrous, or setose, strigose, or fibrillose; cystidia absent; on deciduous wood. 106
106. Context drying very hard and conspicuously zonate; tubes often collapsing into a rigid mass on drying ..... *83. P. fissilis*
Context drying soft to firm, often duplex, azonate ..... *81. P. delectans*
107. Context firm and watery when fresh, soft and punky to corky when dry; spores 6–9 x 5.5–7 $\mu$; on locust trees ..... *79. P. robiniophilus*
Context soft and watery when fresh, drying firm to hard, at least below; spores smaller ..... 108
108. Tubes 3–6 mm. long, when fresh often turning greenish on bruising or on drying; spores 2.5–4 x 2–3 $\mu$ ..... *75. P. fumidiceps*
Tubes usually 5 mm. or more long, not changing to greenish on bruising or drying ..... 109
109. Spores 5–7 x 4–5 $\mu$; context usually duplex when dry; pileus surface matted-tomentose to nearly glabrous when dry .... *77. P. spumeus*
Spores 3–4.5 x 2–3 $\mu$; context drying hard and strongly zonate; surface of pileus matted tomentose to scrupose or strigose when dry; with a fragrant odor when fresh ..... *76. P. galactinus*
Spores 4.5–5.5 x 4–5 $\mu$; context drying hard, zonate; surface appressed-tomentose to glabrous; often with a disagreeable odor when fresh ..... *78. P. Spraguei*

3. Spores cylindrical to ellipsoid

110. Pores 1–3 per mm.; fragrant when fresh; on willow and poplar, See *106. Trametes suaveolens*
Pores 9–11 per mm. See *105. Trametes pusilla*
Pores 3–6 per mm. 111
111. Spores 6–9 $\mu$ long. 112
Spores 3–6 $\mu$ long. 113
112. Pileus effused-reflexed to resupinate, 0–3 cm. broad, 0.5–1.5 cm. thick *93. P. anceps*
Pileus sessile, 2–6 cm. broad, 0.5–2.5 cm. thick *94. P. palustris*
113. Context soft and friable when dry. 114
Context firm to rather hard when dry *97. P. albidus* *98. P. immitis*
114. Pileus sessile; surface often marked with round depressed spots; context 0.2–1 cm. thick *95. P. guttulatus*
Pileus narrowly-reflexed or often resupinate; surface with radial streaks; context 0.25–1 mm. thick *96. P. trabeus*

*Section I. Fruiting body typically stipitate or substipitate.*
*Subsection 1. Context white or whitish, at least when fresh.*
*Series 1. Stem usually black at the base, or black throughout.*

MELANOPUS. Stem black at the base or black throughout, central or excentric to lateral; pileus fleshy-tough to leathery; context white; spores hyaline; usually epixylous.

*I. Pores 3–8 per mm.; spores 2–4 $\mu$ wide.*
*A. Surface of pileus white or whitish.*

### 1. **Polyporus admirabilis** Peck

*P. Underwoodii* Murr.

*Pileus large, 1–3 cm. thick; stem sometimes white throughout.*

**Stem** central or excentric to nearly lateral, rarely lacking, white above, more or less blackened at the base, or sometimes white throughout, glabrous, short and thick, 1–3 cm. long, 2–3 cm. thick; pilei caespitose or solitary, more or less imbricate and united near the base, the compound fruiting body reaching 30 cm. or more in diameter, individual **pilei** leathery when fresh, rigid when dry, centrally depressed, rarely nearly plane, 10–15 cm. broad, 1–3 cm. thick; surface pure white, usually smooth and glabrous, sometimes cracking, more or less discolored in age, azonate to somewhat zonate; margin rather thick, abruptly acute, often undulate, narrowly sterile below; **context** white to yellowish, fleshy-tough when fresh, corky when dry, 1–2.5 cm. thick, the hyphae often branched, thick-walled, 2.5–8 $\mu$ in diameter; **tubes** white to yellowish, darkening with extreme age, 3–7 mm. long, mouths white or sometimes slightly darkening on drying, when fresh "becomes blackish where handled" (Overholts), nearly circular, averaging 3–4 per mm., the edges thin, dentate to lacerate; cystidia not observed; basidia 5–6.5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, 6–9 x 2.5–3.5 $\mu$.

On living deciduous trees, usually apple, recorded on apple, butternut, black ash, white ash, ash unclassified, American elm, sugar maple, glaucous willow, and black willow. Rather rare. Summer and fall. A striking species easily recognized by its shape and pure white color.

NYBG; SM; CU; LM; MU.

Illustrations: Dodge, Mycologia 8:14. *pl. 173* and *174. f. 2.* 1916.

Type of rot: heart rot of apple, see Dodge, Mycologia 8:5–15. 1916.

**2. Polyporus albiceps** Peck

*Pileus small, 0.5–1 cm. thick; stem usually white throughout.*

**Stem** central to subcentral, pallid, rarely slightly black at the extreme base, glabrous, 2.5–4 cm. long, 0.6–0.8 cm. thick; **pileus** tough, plane to slightly depressed, circular in outline, 2.5–5 cm. broad, 0.5–1 cm. thick; surface white, smooth, glabrous; margin thin; **context** white, firm and compact, 4–8 mm. thick; **tubes** decurrent, white, about 1 mm. long, the mouths white, subcircular, minute, the edges thin, dentate.

On wood buried in the ground. Rare, one collection recorded, S. H. Burnham. The above description is adapted from the original one by Peck (*Bull. Torrey Bot. Club* 27:19. 1900) and from Murrill's description (**7,** p. 58). According to Overholts (*Mycologia* 22:244. 1930) this species is scarcely more than a small form of *P. admirabilis.*

LM.

*B. Surface of pileus yellowish to dark brown.*

**3. Polyporus varius** (Pers.) Fries

*P. calceolus* (Bull.) Murr.

*Pileus ochraceous to reddish brown, distinctly radially striate.*

**Stem** excentric to lateral, rarely central, black at the base, velvety to glabrous, 1–4 cm. long, 0.4–1 cm. thick; **pileus** leathery to rigid, circular to flabelliform or reniform in outline, convex to nearly plane, or sometimes depressed at the center, 3–10 cm. in diameter, 0.2–1 cm. thick; surface ochraceous to reddish tan or light reddish brown, glabrous or nearly so, distinctly radially striate with darker fibrils; margin thin, acute or obtuse, often narrowly sterile below; **context** white to cream color, corky, 2–7 mm. thick, the hyphae somewhat branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** decurrent, white to brownish or darker, 1–4 mm. long, the mouths concolorous, circular to angular, 4–5 per mm., the edges at first thick, thinning with age, entire; cystidia none; basidia 5–7 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, sometimes slightly curved, 7–10 x 2.5–3.5 $\mu$.

On the trunks of deciduous trees. Summer and fall. Apparently rare, or has been confused with *P. elegans,* which is usually thinner with striations entirely absent or very faint.

The above description applies to the species as it is now understood in America, following Shope (**15,** pp. 358, 359). It should be noted, however, that the American and the European conceptions are not the same. In Europe, according to Lloyd (**4,** p. 180) the pileus of *P. varius* is dark bay to almost black, and *P. picipes* is the name applied in the United States to a thin dark form of *P. varius.*

NYBG; SM; ?CU; LM; ?BM.

Illustrations: Shope, Ann. Missouri Bot. Gard. 18:432. *pl. 27, f. 4–7.* 1931.

*P. varius* is also represented in New York State by a form quite distinct from the species as described above. The following description is based upon the New York State collection and upon additional collections in the herbarium of the University of Michigan: from Nova Scotia (1), from Ontario (1), and from Montana (2).

**Stem** central to strongly excentric, brownish black at the base or to the tubes, minutely velvety, becoming nearly glabrous, expanding into the pileus, circular to compressed, usually enlarged at the base, 1.5–5 cm. long, 0.3–0.8 cm. thick; **pileus** fleshy-tough and flexible when fresh, rigid and brittle when dry, more or less circular in outline, deep infundibuliform to depressed or nearly plane, 3–8 cm. broad, 0.05–0.2 cm. thick; surface pale grayish buff to pale reddish brown (Tilleul Buff to Wood Brown [R]), rarely grayish black on drying, dull, nearly glabrous, usually with faint radial striations, azonate; margin extremely thin, sterile below; **context** white, when dry firm to hard, fragile, 0.25–0.5 mm. thick in the expanded portion, up to 2 mm. thick on the disk, the hyphae rarely branched, usually thin-walled, 2–3 $\mu$ in diameter; **tubes** white to yellowish, extremely short, 0.25–0.5 mm. long, the mouths concolorous, circular to angular, averaging 5–8 per mm., the edges thick to moderately thin; cystidia none or very doubtfully represented by blunt, irregularly shaped bodies 3–5 $\mu$ in diameter; basidia 5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, 6.5–9 x 2.5–3.5 $\mu$.

On the wood of deciduous trees, August, 1932, Warrensburg, R. R. Hirt.

If the record were based upon a single collection the writer would consider the specimen or specimens immature conditions of *P. varius,* and this would be supported by the loosely formed condition of the hymenium in these specimens, as contrasted by the compactly formed hymenium typical of the *P. varius* group. All of the specimens examined, however, constantly exhibited the features characteristic of this form, namely the color of the pileus, the thin context, and the short tubes.

### 4. **Polyporus elegans** (Bull.) Fries

*P. elegans* var. *brevipes* H. D. House

*Pileus ochraceous to dull orange, scarcely radially striate.*

**Stem** central to lateral, black at the base, pruinose or glabrous, 0.2–8 cm. long, 0.2–1 cm. thick; **pileus** leathery when fresh, rigid when dry, circular to reniform or flabelliform, sometimes with a depressed center, or convex to nearly plane, 1–9 cm. broad, 0.2–1 cm. thick; surface pale ochraceous or dull orange, pruinose to glabrous, often somewhat faintly radiate-striate, but never markedly so; margin thin, frequently sterile below in young specimens; **context** white to pallid, corky, 1–6 mm. thick, the hyphae moderately branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** decurrent, whitish, becoming yellowish or yellowish brown when dry, 1–3 mm. long, mouths concolorous, circular to angular, aver-

aging 4–5 per mm., the edges becoming moderately thick, entire; cystidia none; basidia 7–8.5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 6–8 x 2.5–3.5 $\mu$.

On the wood of deciduous trees, recorded on basswood, yellow birch, birch unclassified, and wild red cherry. Common. Summer and fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Lloyd, Mycol. Notes 64: *pl. 167, f. 1833–1835.* 1920; Overholts, Wash. Univ. Studies 3:84. *pl. 1, f. 1, a–c.* 1915; Shope, Ann. Missouri Bot. Gard. 18:432. *pl. 27, f. 1–2.* 1931.

### 5. **Polyporus picipes** Fries

*P. fissus* Berk.

*Pileus brown or darker; pores 6–8 per mm.; on old wood.*

**Stem** central to excentric, black at the base or more often black to the pores, at first velvety, becoming almost glabrous, usually minutely punctate, 1–5 cm. long, 0.5–1.5 cm. thick; **pileus** leathery when fresh, rigid and brittle when dry, circular to reniform, convex to depressed or infundibuliform, 5–20 cm. broad, 0.2–0.8 cm. thick; surface chestnut-brown or reddish brown or darker, rarely yellowish brown, usually darker in the center, glabrous, azonate; margin very thin, usually darkening on drying, fertile below; **context** white or pallid, tough when fresh, firm to hard when dry, 1–7 mm. thick, the hyphae moderately branched, thick-walled, 2–4 $\mu$ in diameter; **tubes** decurrent, white to brownish, 1–3 mm. long, mouths concolorous, at first circular, then angular, with age becoming more or less confluent and daedaloid, averaging 6–8 per mm., the edges moderately thick, entire; cystidia none; basidia 6–8 $\mu$ in diameter; **spores** hyaline, smooth, cylindric-ellipsoid, 5.5–7 x 2–3 $\mu$.

On stumps and logs of deciduous or rarely of coniferous trees, recorded on apple, ash, beech, willow, and conifer unclassified. Common. Summer and fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Hard, Mushrooms, p. 388, *f. 319.* 1908; Moffat, Bull. Nat. Hist. Surv. Chicago Acad. Sci. 7, I: *pl. 12, f. 2.* 1909; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:184. *pl. 14, f. 52, a–b.* 1914.

### 6. **Polyporus melanopus** (Swartz) Fries

*Scutiger subradicatus* Murr.

*Pileus brown or darker; pores 3–4 per mm.; on the ground.*

**Stem** central or excentric, unbranched or rarely branched once or twice, black to the tubes, minutely tomentose, usually slender, sometimes thickened, 2–4 cm. long, 0.6–2.5 cm. thick; **pileus** fleshy-tough when fresh, rigid and brittle when dry, irregular in outline, convex to plane or infundibuliform, 3–12 cm. broad, 0.3–0.8 cm. thick; surface at first yellowish, soon changing to

yellowish brown or dark brown, with fine appressed fibrils giving a more or less reticulate appearance to the surface, or almost glabrous, azonate; margin thin, acute, fertile below; **context** white, fleshy-tough when fresh, friable when dry, 1–7 mm. thick, the hyphae of two kinds: some much branched, thin-walled, irregular, 3–11 $\mu$ in diameter, others somewhat branched, thick-walled, 3–6 $\mu$; **tubes** decurrent, white, yellowish when dry, up to 1 mm. long, mouths concolorous, regularly angular or breaking up to form extra large pores, or elongate and more or less sinuous, averaging 3–4 per mm., the edges moderately thick to thin, entire to fimbriate; cystidia none; basidia 6–8 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical to ellipsoid, 7–10 x 3–4 $\mu$.

On the ground attached to buried wood. Apparently rather rare. Summer and fall. Similar to *P. picipes,* but differs in growing on the ground, and in usually being a thicker plant. Spores from the type of *S. subradicatus* measured 6.5–9.5 x 3–3.5 $\mu$, rather than 5–7 x 3–4 $\mu$, as given by Murrill (*Bull. Torrey Bot. Club* 30:430. 1903.)

NYBG; SM; CU; LM; CF; MU.

Illustrations: Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:184. *pl. 14, f. 53.* 1914 (as *P. subradicatus*).

*II. Pores 2–3 per mm. or larger; spores 4–8 $\mu$ wide.*

### 7. Polyporus radicatus Schw.

*P. Morgani* Frost; *P. Morgani* var. *velutipes* Peck; *Scutiger radicatus* (Schw.) Murr.

*Stem central, rooting; pileus brown, rough; pores 2–3 per mm.*

**Stem** central, unbranched or rarely branching once or twice, black at the base, rooting, velvety to squamulose, 5–15 cm. long, 0.5–2 cm. thick; **pileus** fleshy-tough when fresh, fragile when dry, circular in outline, convex to depressed, 3–20 cm. wide, 0.3–2 cm. thick; surface yellowish brown to dark blackish brown, fibrillose-scaly to squamulose, or minutely scabrous, azonate; margin thin and acute, often involute on drying, fertile below; **context** white or light yellowish, spongy when fresh, soft and friable when dry, 3–15 mm. thick, the hyphae somewhat branched, thin-walled, 4–10 $\mu$ in diameter; **tubes** decurrent, white when fresh, becoming yellowish brown on drying, 1–5 mm. long, mouths concolorous, angular to sinuous, averaging 2–3 per mm., the edges thin, lacerate; cystidia none; basidia 10.5–13 $\mu$ in diameter; **spores** hyaline, smooth, ovoid-ellipsoid to subfusiform, 12–15 x 6–8 $\mu$.

On the ground attached to buried roots. Uncommon. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hard, Mushrooms, p. 400. *f. 329.* 1908; Lloyd, Synop. Sect. Ovinus, p. 88: *f. 508.* 1911, and the same in Synop. Stip. Polyp., p. 169, *f. 465.* 1912; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:186. *pl. 15, f. 54.* 1914.

**8. Polyporus squamosus** (Huds.) Fries

*P. caudicinus* (Scop.) Murr.

*Stem typically lateral; pileus with large scales; pores 1–2.5 mm. broad.*

**Stem** lateral or sometimes excentric to central, often rudimentary, black at the base, whitish or yellowish and reticulate above, 1–5 cm. long, 1 cm. or more thick; **pileus** somewhat fleshy when fresh, drying hard and brittle, dimidiate, reniform or becoming flabelliform, 5–25 cm. broad, 0.5–4 cm. thick; surface whitish or discoloring to yellowish or brownish, smooth but with large appressed scales which are somewhat darker and often concentrically arranged, glabrous; margin thin, acute, fertile below; **context** white, soft when fresh, drying spongy-friable to corky-fragile, 0.5–3 cm. thick, the hyphae occasionally branched, thick-walled, 3–8 $\mu$ in diameter; **tubes** decurrent, white to yellowish, or darker on drying, at first shallow pits or reticulations, becoming up to 8 mm. long, mouths concolorous, large and angular, 1–2.5 mm. broad, the edges thin, entire to dentate or lacerate; cystidia none; basidia "8 $\mu$ broad" (Shope); **spores** hyaline, smooth, elongate-ovoid to ellipsoid, apiculate, 12–16 x 4.5–6 $\mu$.

On living or dead deciduous trees, recorded on American elm, elm unclassified, black willow, and willow unclassified. Rather rare. Spring.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Duggar, Fung. Dis. Plants, p. 454, *f. 223*, and p. 455, *f. 224*. 1909; Hard, Mushrooms, p. 396, *f. 325*. 1908; Hesler, Jour. Tennessee Acad. Sci. 4:5. *f. 2*. 1929; Lloyd, Photogravure Amer. Fungi, *Issue No. 5;* Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:184. *pl. 14, f. 51 b*, and p. 186, *pl. 15, f. 51 a*. 1914; Shope, Ann. Missouri Bot. Gard. 18:436. *pl. 29, f. 1–2*. 1931.

Type of rot: white rot, see Buller, Jour. Econ. Biol. 1:101–138. 1906 (biology), and von Schrenk and Spaulding (**13,** pp. 48, 49).

The following two species, though with unblackened stems in the specimens seen, are considered to be merely scaleless or minutely scaled forms of *P. squamosus.*

**8a. Polyporus pennsylvanicus** Sumstine

*Stem pallid to the base; pileus scaleless; pores about 1 per mm.*

**Stem** excentric, pallid to reddish with blackish stains, more or less concolorous throughout, 2–4 cm. long, 0.8–1.2 cm. thick; **pileus** circular to irregular, 4–8 cm. broad, 0.3–0.5 cm. thick; surface light tan, entirely without scales, azonate; **context** white to pallid, soft and punky to somewhat fragile when dry, 2–4 mm. thick, the hyphae usually thick-walled, rarely branched, 3–9 $\mu$ in diameter, sometimes thin-walled, more often branched, 4–10 $\mu$; **tubes**

decurrent, concolorous or darker, 1–3 mm. long, mouths concolorous, angular, radially elongated, 0.8–1 mm. broad, the edges thin, entire to toothed; hyphal pegs 30–80 $\mu$ in diameter, projecting 50–110 $\mu$; cystidia not observed; basidia 9–11 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, 11–15 x 4–5 $\mu$.

On the wood of deciduous trees. Uncommon. Summer. The specimens (two collections at Albany (SM)) forming the basis of this report have been variously named. Peck referred them to *P. pallidus* Schulz.; Lloyd referred the same specimens to *P. Rostkowii*. *P. pennsylvanicus* is here accepted because it is the only certain name known to the writer for this form of *P. squamosus*.

SM; MU.

**8b. Polyporus fagicola** Murr.

*Stem pallid to the base; pileus with small tufts; pores 1–2 per mm.*

**Stem** central, white to brownish, conspicuously hispid, especially near the base, 2–4 cm. long, 1 cm. thick; **pileus** fleshy-tough when fresh, rigid and fragile when dry, circular, convex to plane, umbilicate, 4–6.5 cm. broad, 0.1–0.3 cm. thick; surface pale brown or light yellowish brown, with tufts of small innate fibrils which are larger and darker near the center and sometimes are radially and imbricately arranged, or nearly smooth, azonate, much wrinkled on drying; margin thin, fertile below; **context** white, fibrous, when dry 1–2 mm. thick, the hyphae occasionally branched, usually thin-walled, often varying abruptly in thickness, 3–12 $\mu$ in diameter; **tubes** decurrent, white or whitish, about 1 mm. long, mouths concolorous, angular, 1–2 per mm., the edges very thin, minutely fimbriate; cystidia-like bodies present, 7–8 $\mu$ in diameter, projecting up to 20 $\mu$; basidia 7–8 $\mu$ in diameter; **spores** hyaline, smooth, cylindric-ellipsoid to subfusiform, 11–15 x 4.5–5.5 $\mu$.

On limbs, recorded only on beech, Arkville, W. A. Murrill. Through the courtesy of Dr. F. J. Seaver a part of the type specimen was loaned for study. The spores measure as above, rather than 6–7 x 3–4 $\mu$, as stated by Murrill (*Torreya* 6:35. 1906).

NYBG.

Illustrations: Lowe, Papers Michigan Acad. Sci., Arts, Lett. 19. *pl. 15, f. 3–4.* 1934.

*Series 2. Stem not black at the base nor black throughout, white or variously colored, more or less concolorous throughout.*

*I. Stem unbranched, or rarely branching once or twice.*

*A. Context duplex, firm below, spongy above (compare also 80. P. borealis).*

SPONGIOSUS (WHITE). Stem central to lateral, rarely wanting; context white, soft and spongy to firm, duplex; spores hyaline; usually epixylous.

**9. Polyporus humilis** Peck

*Laterally stipitate; pileus white; pores 4–5 per mm.*

**Stem** usually lateral or nearly so, white, minutely tomentose, 2–4 cm. long, 0.2–1 cm. thick; **pileus** soft and flexible when fresh, spathulate or flabelliform to reniform or circular, 1–5 cm. broad, 0.1–0.4 cm. thick; surface white, finely tomentose, azonate, somewhat wrinkled on drying; margin thick to thin, acute to obtuse, sterile below; **context** white, duplex, firm next the tubes, soft and spongy above, 0.5–2 mm. thick, the hyphae rarely branched, thin-walled, 2–3 $\mu$ in diameter; **tubes** decurrent, white, rarely in two layers, 0.5–2 mm. long, mouths concolorous, angular, averaging 4–5 per mm., the edges thin, entire; cystidia none; basidia 5.5–8 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, ovoid to subglobose, 4.5–5.5 x 4–5 $\mu$.

On old sticks and branches on the ground. Rare. Summer and fall.

NYBG; SM; CF.

Illustrations: Lloyd, Mycol. Notes 56:805. *f. 1252.* 1918 (typical); Overholts, Wash. Univ. Studies 3:84. *pl. 1, f. 4.* 1915.

**10. Polyporus distortus** (Schw.) Fries

*P. abortivus* Peck; *Abortiporus distortus* (Schw.) Murr.

*Pileus often distorted, light colored; pores 1–3 per mm.*

**Stem** central to lateral, or wanting, surface white to tan or reddish, tomentose, when well developed up to 5 cm. long, but often rudimentary and tubercular; **pileus** fleshy-tough to coriaceous, variable in form and size, when well developed with a circular pileus 2–8 cm. broad, 0.4–1.5 cm. thick, sometimes narrow infundibuliform, often distorted and the tubes almost to entirely covering the surface; surface white to tan or reddish, villose-tomentose, sometimes almost glabrous, azonate; margin thin to thick, acute to obtuse, sterile or fertile below; **context** white when fresh, light brown when dry, duplex in well developed specimens, the layer next the tubes firm and corky, lighter colored and softer above, 0.2–1 cm. thick, the hyphae rarely branched, thin-walled to thick-walled, 4–8 $\mu$ in diameter; **tubes** whitish, darkening somewhat on drying, 1–6 mm. long, mouths more or less concolorous, when fresh reddish where bruised, angular to daedaloid or irregular, averaging 1–3 per mm., the edges thin, entire; **cystidia** usually present, 6–10 $\mu$ in diameter, scarcely projecting beyond the hymenium and sometimes buried in the tramal tissue; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, ellipsoid to ovoid, 5–7 x 3.5–5 $\mu$.

On the ground about stumps and trunks of deciduous trees, recorded only about butternut. Uncommon. Summer and fall. According to Lloyd (**4**, p. 158) this is a form of *P. rufescens* (Pers.) Fries of Europe. The American name is used here as no specimens of *P. rufescens* have been available for study.

NYBG; SM; CU; LM.

Illustrations: Lloyd, Synop. Stip. Polyp. p. 158, *f. 456* (as *P. rufescens*), and p. 159, *f. 458*. 1912, also in Mycol. Notes 40:549. *f. 753*. 1916, and in Mycol. Notes 69: *pl. 236, f. 2395*. 1923 (as *P. rufescens*); Overholts, Wash. Univ. Studies 3:84. *pl. 1, f. 3, a–b*. 1915.

*Polyporus Balloui* Lloyd. A form of *P. distortus* with small pores. Recently, through the courtesy of Dr. C. E. Fairman, the writer had an opportunity to examine a specimen so named and reported by Lloyd. The pores averaged 3–5 per mm. and the spores were variable, most 4–4.5 x 2–3 $\mu$, some 6 x 7 $\mu$, both appearing normal; all other characters were as described for *P. distortus* and the plant ought to be considered a small-pored form of that species. According to Lloyd (*Letter* 58:7. 1915) *P. tropicalis* Murr. (*Mycologia* 2:185. 1910) is the same as *P. Balloui*, and No. 11 of this series of descriptions was based upon the type specimen of *P. tropicalis*, collected in Jamaica in the West Indies. *P. tropicalis* differs from the specimen Lloyd named *P. Balloui* in that the pores are much smaller, 10–12 per mm., and the spores regularly smaller, 4–6 x 4–5 $\mu$. A description of the type of *P. tropicalis* for a plant occurring in New York State was therefore in error.

LM.

Illustrations: Lloyd, Mycol. Notes 69: *pl. 236, f. 2395–2396*. 1923.

*B. Context homogeneous.*

*1. Stem lateral, or pilei pendant.*

PETALOIDES. Stem typically lateral, or central and pilei pendant, pallid, concolorous throughout; context white; spores hyaline; epixylous.

*a. Context 0.3–3.5 cm. thick; stem usually lateral (compare also 23. P. confluens; 24. P. cristatus; and 28. P. Berkleyi).*

**12. Polyporus betulinus** (Bull.) Fries

*Piptoporus suberosus* (L.) Murr.

*Spores allantoid, 4–5 x 1.5–2 $\mu$; sterile margin thick; on birches.*

**Stem** when present represented by a rather stout lateral umbo, or rarely pileus centrally attached and pendant, sometimes nearly sessile; **pileus** fleshy-tough to corky, dimidiate or reniform to circular, 3–15 x 3–20 x 1–5 cm.; surface covered with a tan, or grayish brown, or smoky pellicle, smooth, glabrous, azonate; margin incurved, projecting beyond the pore surface as a wide sterile band; **context** white, somewhat fleshy when fresh, soft-corky when dry, 1–3.5 cm. thick, the hyphae rarely branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** white, becoming darker in old specimens, 3–9 mm. long, "separating in a smooth layer from the context" (Overholts), mouths white, often darkening to almost black in old specimens, circular to angular, averaging 3–4 per mm., the edges at first thick and obtuse, becoming thin and irregularly cut with age; pore surface at times covered with projecting clumps of agglutinated dissepiments simulating teeth; cystidia not observed; basidia 3 $\mu$ in diameter; **spores** hyaline, smooth, allantoid. 4–5 x 1.5–2 $\mu$.

On birch trees, recorded on gray birch, yellow birch, sweet birch, and white birch. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hard, Mushrooms, p. 408, *f. 337.* 1908; Lloyd, Synop. Apus Polyporus, p. 294, *f. 631–632.* 1915; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:182. *pl. 13, f. 46, a–b.* 1914; von Schrenk and Spaulding, U. S. Dept. Agr. Bur. Plant Indus. Bull. 149: *pl. 9, f. 1–2.* 1909; White, Connecticut Geol. and Nat. Hist. Surv. Bull. 3:65. *pl. 37.* 1905.

Type of rot: powdery sapwood rot of birches, see Rankin (**12,** pp. 113–115); and von Schrenk and Spaulding (**13,** pp. 51, 52).

**13. Polyporus osseus** Kalchbr.

*Spores cylindrical, 4–7 x 2–2.5 μ; pores 4–6 per mm.; on conifers.*

**Pilei** substipitate, narrowed to a lateral stem-like base, fleshy-tough when fresh, bone hard when dry, sometimes imbricate, 1–6 x 2–8 x 0.3–1 cm.; surface white to light gray or brownish, drying somewhat darker and wrinkled, minutely tomentose to nearly glabrous, azonate; margin thin, fertile below; **context** white, firm when fresh, drying bone hard, 3–7 mm. thick, the hyphae much branched, thin-walled, irregular, 5–10 μ in diameter; **tubes** decurrent, white to ochraceous, 1–3 mm. long, mouths concolorous with the tubes, angular, averaging 4–6 per mm., the edges thin, becoming lacerate; cystidia none; basidia 4–5 μ in diameter; **spores** hyaline, smooth, cylindrical, 4–7 x 2–2.5 μ.

On the stumps and roots of coniferous trees, recorded on white pine and pine unclassified. Occasional. Summer and early fall.

SM; LM; CF; MU.

Illustrations: Lloyd, Synop. Stip. Polyp., p. 188, *f. 496.* 1912; Shope, Ann. Missouri Bot. Gard. 18:436. *pl. 29, f. 3.* 1931.

**14. Polyporus hirtus** Quél.

*P. hispidellus* Peck; *Scutiger hispidellus* (Peck) Murr.

*Spores subfusiform, 12–16 x 4–6 μ; pores 2 per mm.; on conifers.*

**Stem** lateral, rarely excentric, often irregular, whitish or brownish, hispid, 2–3 cm. long, 1–2.5 cm. thick; **pilei** usually solitary, fleshy-tough, circular or subcircular to more or less reniform, 5–8 cm. broad, 0.5–1.5 cm. thick; surface grayish brown or brown, minutely hispid, azonate, smooth, areolate or squamulose with age; margin thin and acute, fertile below; **context** white, soft when fresh, drying rather hard, 3–10 mm. thick, the hyphae occasionally to often branched, thin-walled, irregular, 4–8 μ in diameter, occasionally larger; **tubes** decurrent, white, drying darker, occasionally blackish where bruised, 3–10 mm. long, mouths concolorous with the tubes, angular or irregular, averaging about 2 per mm., the edges becoming thin, dentate; cystidia none; basidia "8–10 μ broad" (Shope); **spores** hyaline, smooth, subfusiform, 12–16 x 4–6 μ.

Around the base of coniferous trees or stumps, or attached to buried wood. Rare, but two collections known, both from near North Elba. The species is more abundant in the western United States.

SM; CF.

Illustrations: Lloyd, Synop. Stip. Polyp., p. 129, *f. 426.* 1912; Shope, Ann. Missouri Bot. Gard. 18:432, *pl. 27, f. 3.* 1931.

*b. Context 0.5–2 mm. thick; pilei usually pendant (compare also laterally stipitate or substipitate species 59. P. rhipidium; 69. P. conchifer; 72. P. semisupinus; 73. P. floriformis; and 74. P. balsameus).*

**15. Polyporus pocula** (Schw.) Berk. and Curt.

*P. cupulaeformis* Berk. and Curt.; *Porodiscus pendulus* (Schw.) Murr.; *Porodisculus pendulus* (Schw.) Murr.

*Pileus brownish, very small; dissepiments thick; on hardwoods.*

**Stem** dorsally attached and expanding into the pileus, pendant from dead branches, whitish to brown, pruinose or mealy, not more than 5 mm. long; **pileus** coriaceous when fresh, rigid when dry, circular in outline, 2–5 mm. broad, 1–3 mm. thick; surface brownish, or sometimes whitish pruinose or mealy, azonate; margin thick, inrolled, forming a wide sterile band around the pore surface; **context** white, leathery when fresh, hard when dry, less than 1 mm. thick, with large, thin-walled, subglobose to elongated vesicular bodies 8–13 $\mu$ in diameter, occurring free in the context (?chlamydospores), or apparently the swollen ends of hyphae, the context hyphae rarely to somewhat branched, thin- to rather thick-walled, 3–5 $\mu$ in diameter; **tubes** whitish or brownish, not more than 0.75 mm. long, mouths whitish or brownish, at first pruinose, circular, averaging 5–6 per mm., the edges thick, composed of a mass of strongly incrusted hyphal tips; cystidia none; basidia 3–3.5 $\mu$ in diameter; **spores** "allantoid, hyaline, 3–4 x 1 $\mu$" (Overholts).

On branches of deciduous trees, recorded on beech, butternut, cherry, chestnut, black oak, and chestnut oak. Frequent. Apparently throughout the year. According to Overholts (**8,** p. 15) this is the smallest polypore known.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Lloyd, Polyp. Issue 3:45, *f. 369,* and p. 46, *f. 370.* 1910, also in Synop. Stip. Polyp., p. 140. *f. 443.* 1912, and in Mycol. Notes 41:569. *f. 777.* 1916.

**16. Polyporus subpendulus** Atk.

*Tyromyces subpendulus* Atk.

*Pileus white, very small; dissepiments thin; on conifers.*

**Stem** short, broadening into the vertex of the pileus, often pendant, whitish, glabrous, cylindrical, 1–2 mm. long; **pileus** fibrous-fleshy when fresh, firm and friable when dry, convex, ungu-

late to subapplanate, sometimes laterally confluent, 3–6 x 5–10 x 2–6 mm.; surface white with sordid pale yellow stains, glabrous, subpelliculose, nearly smooth, radiately rugose with the wrinkles often stained more deeply and sometimes slightly anastomosing behind; margin obtuse, usually entirely surrounding the pore surface, about 1 mm. wide; **context** white, radiately fibrous, friable, azonate, 0.5–2 mm. thick, thinner toward the margin, "the hyphae 3–5 $\mu$ in diameter except for some larger hyphae up to 10 $\mu$ or more at the inflations" (Overholts); **tubes** pale cream color, about 2 mm. long, mouths white or whitish, circular to irregular, especially at the margin, 6–8 per mm., the edges thin, entire to slightly dentate; cystidia none; basidia "5–6 $\mu$ broad" (Overholts); **spores** "hyaline, smooth, elliptical, straight or slightly curved, . . ., 4–5 x 2 $\mu$" (Atkinson), "cylindric, flattened on one side or slightly curved" (Overholts).

On hemlock, known only from the type collection, Ithaca. J. M. Hook. October. The above description was drawn in part from notes on the type specimen, in part from Atkinson's original description (*Ann. Mycol.* 6:61, 62. 1908) and from notes by Overholts found with the type specimen, published with his permission.

CU.

*2. Stem central to excentric, rarely truly lateral.*

*a. Pilei when fresh more or less coriaceous or fleshy-tough; usually epixylous (compare also 1. P. admirabilis; 2. P. albiceps; 8a. P. pennsylvanicus; and 8b. P. fagicola).*

LENTUS. Stem central to excentric; pileus fleshy-tough to coriaceous, thin; context white; spores hyaline; usually epixylous.

### 17. Polyporus Peckianus Cooke

*P. flavidus* Peck; *Polystictus Peckianus* (Cooke) Sacc.; *Grifola fractipes* (Berk. and Curt.) Murr. sense No. Amer. Flora 9: 69. 1907 in part.

*Spores 3–3.5 x 2.5 $\mu$; pileus more or less yellow; pores 4–5 per mm.*

**Stem** central to excentric, sometimes branched, pallid, glabrous, 2–4 cm. long, 0.5–1.5 cm. thick; **pileus** fleshy-tough when fresh, rigid and brittle when dry, depressed to infundibuliform, more or less circular to flabelliform, 4–10 cm. broad, 0.2–0.5 cm. thick; surface yellow to more or less ochraceous or brownish when dry, nearly glabrous, zonate to azonate; margin thin, acute, sterile below; **context** white, firm and fragile when dry, 1–2 mm. thick, the hyphae often branched, thin-walled, very irregular, 4–15 $\mu$ in diameter; **tubes** decurrent, white to pale yellowish, varying to ochraceous when dry, 1–3 mm. long, mouths concolorous, angular, averaging 4–5 per mm., the edges thin, finely dentate; cystidia none; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, sometimes one-guttulate, ovoid to subglobose, 3–3.5 x 2.5 $\mu$.

On the ground or attached to buried wood, recorded only about basswood. Rare. Summer.

NYBG; SM; CU; LM.

**18. Polyporus arcularius** (Batsch) Fries

*Spores 6–9 x 2–3 μ; pores 1–2 per mm.; pileus squamulose to glabrous.*

**Stem** central, yellowish brown to dark brown, squamulose to glabrous, sometimes hispid at the base, 2–6 cm. long, 0.2–0.4 cm. thick; **pileus** fleshy-tough when fresh, rather brittle when dry, circular, convex to depressed or infundibuliform, 2–8 cm. broad, 0.2–0.4 cm. thick; surface light brown to yellowish brown or dark brown, squamulose, hispid-tomentose to glabrous, azonate; margin acute, often ciliate, usually fertile below; **context** white, soft fleshy-fibrous when fresh, drying firm and fragile, 0.5–2 mm. thick, the hyphae somewhat branched, usually thick-walled, 2–5 μ in diameter; **tubes** sometimes decurrent, white to pallid, darker when dry, 1–2 mm. long, mouths concolorous, angular, often radially elongated, averaging 1–2 per mm., the edges thin, very finely dentate; cystidia none; hyphal pegs projecting up to 50 μ, up to 30 μ in diameter; basidia 5–6 μ in diameter; **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, 6–9 x 2–3 μ.

On the wood of deciduous trees. Apparently rare. Spring and early summer, rarely in the fall and then with slender stem and thin small pileus with scattered marginal cilia (*P. arcuariellus* of Murrill).

NYBG; SM; CU; MU.

Illustrations: Hard, Mushrooms, p. 407, *f. 336.* 1908; Overholts, Wash. Univ. Studies 3:84. *pl. 1, f. 2, a–c.* 1915; Shope, Ann. Missouri Bot. Gard. 18:426. *pl. 24, f. 5–6.* 1931.

**19. Polyporus brumalis** (Pers.) Fries

*P. Polyporus* (Retz.) Murr.

*Spores 8–9.5 x 2.5 μ; pores 2–3 per mm.; pileus hispid to glabrous.*

**Stem** central to excentric, grayish or brownish, minutely hispid, 1–3 cm. long, 0.2–0.3 cm. thick; **pileus** fleshy-tough when fresh, rigid and rather brittle when dry, circular, convex to depressed, 2–6 cm. broad, 0.2–0.4 cm. thick; surface yellowish brown to dark brown or almost black, minutely hispid to glabrous, usually azonate but sometimes distinctly zoned; margin thin, fertile below; **context** white, tough when fresh, firm and rather fragile when dry, 1–2 mm. thick, the hyphae rarely to somewhat branched, thick-walled, 2–5 μ in diameter; **tubes** usually slightly decurrent, whitish when fresh, becoming light brown on drying, 1–3 mm. long, mouths concolorous, circular, becoming angular, often radially elongated, averaging 2–3 per mm., the edges at first thick, becoming rather thin, entire; cystidia none; hyphal pegs scattered, up to 30 μ wide, projecting up to 30 μ; basidia 4–5 μ in diameter; **spores** hyaline, smooth, cylindrical, slightly apiculate, 8–9.5 x 2.5 μ.

On wood of deciduous trees, recorded on alder, beech, black cherry, wild cherry, cherry unclassified, chestnut, elderberry, elm, Tree of Heaven (Ailanthus), locust, striped maple, oak, and Vaccinium sp. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Atkinson, Mushrooms, ed. 3, p. 191, *pl. 71, f. 186*, 1911; Hard, Mushrooms, p. 406, *f. 335*, 1908; Moffatt, Bull. Nat. Hist. Surv. Chicago Acad. Sci. 7, 1: *pl. 12, f. 1*, 1909; Murrill, Mycologia 10:107, *pl. 6, f. 3*, 1918; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:182, *pl. 13, f. 47, a–b*, 1914.

*b. Pilei when fresh fleshy to firm fleshy; terrestrial.*

OVINUS. Stem central to excentric, rarely lateral; pileus fleshy when fresh, usually thick; context white; spores hyaline; terrestrial.

### 20. Polyporus griseus Peck

*Scutiger griseus* (Peck) Murr.

*Pileus grayish or bluish gray when fresh; spores tuberculate.*

**Stem** central, surface more or less grayish, short bulbous at the base, 4–5 cm. long, 1–1.5 cm. thick; **pileus** firm-fleshy when fresh, circular or often irregular, convex, 7–12 cm. broad, 1 cm. or less thick; surface more or less grayish or bluish-gray, slightly darker toward the center, glabrous to minutely tomentose, dry, azonate, wrinkled on drying; margin thin, fertile below; **context** rosy-gray when fresh, darkening on drying, soft-fleshy when fresh, soft and friable to hard and fragile when dry, about 5 mm. thick, the hyphae often branched, thin-walled, irregular, 4–15 $\mu$ in diameter; **tubes** slightly decurrent, whitish to olivaceous brown or dark brown, 1–2 mm. long, mouths white when young, becoming gray to dark brown, subangular, unequal, 2–4 per mm., the edges thin, entire to fimbriate, lacerate with age; cystidia none; basidia not observed; **spores** hyaline, coarsely tuberculate, broadly ellipsoid to subglobose, 5–6 x 4.5–5 $\mu$.

On the ground under trees. Rare. Fall. This species has been placed in synonymy with *P. subsquamosus* (L.) Fries (or *P. leucomelas* var. *subsquamosus* (L.), see A. Pilát, *Beih. Bot. Centralbl. Bd. 4s. Abt. II. p. 426. 1951*. Tuberculate spores are known among the polypores only in *P. leucomelas* and in *P. griseus* (= *subsquamosus*) according to Lloyd (3, p. 78, footnote 9).

NYBG; SM; LM; ?CF.

Illustrations: Lloyd, Synop. Sect. Ovinus, p. 78, *f. 499–500*, 1911.

**21. Polyporus caeruleoporus** Peck

*Scutiger caeruleoporus* (Peck) Murr.

*Pileus violaceous or bluish when fresh; spores smooth.*

**Stem** central or excentric to nearly lateral, more or less blue or bluish, glabrous, 2.5–5 cm. long, about 0.5 cm. thick; **pileus** fleshy, convex, more or less circular, 2.5–5 x 0.3–1 cm.; surface bright violaceous, blue, smoky indigo, or grayish blue, dry, glabrous, when dry bluish-black or grayish-blue; margin lobed, fertile below; **context** white, 1–5 mm. thick, the hyphae often branched, thin-walled, variable in size, 2.5-6 $\mu$ in diameter; **tubes** decurrent, pale blue, 2–5 mm. long, mouths pale indigo blue or bright bluish color when fresh, fading on drying to brown, angular, averaging 2–3 per mm., the edges thin, entire to fimbriate; cystidia none; basidia 6 $\mu$ in diameter; **spores** hyaline, smooth, subglobose, 3.5–5 $\mu$.

On the ground in woods. Rare. Fall. The above description is based in part, especially with regard to the character of the fresh specimen, on Overholts' Notes (*Bull. Torrey Bot. Club* 49:169, 170. 1922).

NYBG; SM.

**22. Polyporus ovinus** (Schaeff.) Fries

*Scutiger ovinus* (Schaeff.) Murr.

*Pileus solitary, drying brownish; pores often blackish.*

**Stem** central or excentric, whitish to tan colored, drying darker, often black spotted, tomentose, usually with a bulbous base, 2–6 cm. long, 1–2 cm. thick; **pilei** usually solitary, firm-fleshy when fresh, drying fragile, circular, convex, 4–10 cm. in diameter, 0.3–1 cm. thick; surface white to tan colored, dull, drying light brown to grayish brown or darker, often black spotted, at first tomentose, with age becoming more or less glabrous and areolate or subsquamulose; margin acute, sterile below; **context** at first white, drying light pinkish brown with a distinct tint of gray on smooth section, or sometimes black or blackish, firm when fresh, drying firm to hard and fragile, often containing a black line adjacent to the tubes, 1–6 mm. thick, the hyphae often branched, thin-walled, of markedly unequal diameters, varying from 4 $\mu$ up to 25 $\mu$; **tubes** decurrent, at first whitish, drying light brown to yellowish brown or chestnut brown, often olivaceous black, 1–3 mm. long, mouths concolorous, angular, 2–3 per mm., the edges becoming dentate with age, moderately thin; cystidia none; basidia "3–4 $\mu$ in diameter" (Shope); **spores** hyaline, smooth, apiculate, often one-guttulate, ovoid to subglobose, 3.5–4.5 x 2.5–3.5 $\mu$.

On the ground in coniferous woods. Rare. Late summer and early fall.

NYBG; SM.

Illustrations: Lloyd, Synop. Sect. Ovinus, p. 77, *f. 497.* 1911; Shope, Ann. Missouri Bot. Gard. 18:426. *pl. 24, f. 2.* 1931.

**23. Polyporus confluens** (Alb. and Schw.) Fries

*Scutiger Whiteae* Murr.

*Pilei usually caespitose, drying reddish; pores scarlet or brown.*

**Stem** central to excentric, rarely lateral, unbranched or more often branched and confluent, whitish or pinkish to brownish or reddish, glabrous, circular to somewhat compressed, 1.5–3 cm. thick, up to 4 cm. long; **pilei** caespitose or rarely solitary, fleshy, watery but rather firm when fresh, drying rather hard and brittle, circular to irregular, sometimes flabelliform or nearly reniform, convex to plane or slightly depressed, 5–15 cm. in diameter, 0.5–1.5 cm. thick; surface uniformly very light tan to dark cream when fresh, drying with a distinct reddish color, or sometimes cinnamon brown, very minutely tomentose to glabrous, with age sometimes becoming more or less areolate or scaly; margin thin, fertile below; **context** white, fleshy-tough and watery when fresh, drying pinkish or varying to dark resinous red, usually shrinking much on drying, firm and fragile to hard and brittle, sometimes with a reddish orange layer next the tubes, up to 10 mm. thick, the hyphae often branched, thin-walled, very irregular, 3–8 $\mu$ in diameter, occasionally up to 18 $\mu$; **tubes** decurrent, white, with a pinkish cast on bruising, becoming scarlet or cinnamon brown on drying, 1–3 mm. long, mouths concolorous, angular, 2–3 per mm., the edges becoming thin, fimbriate; cystidia none; basidia "5.5 $\mu$ in diameter" (Hirt); **spores** hyaline, smooth, apiculate, broadly ellipsoid to subglobose, or sometimes somewhat cylindric-ellipsoid, 3.5–5 x 2.5–4 $\mu$.

On the ground in woods. Rare. Summer and early fall. When growing singly it is difficult to distinguish from *P. arcinus*, but it usually can be identified by the color changes on drying. Specimens of one collection referred to this species had hollow stems, a character not mentioned in the literature.

NYBG; SM; LM; CF; MU.

Illustrations: Kauffman, Papers Michigan Acad. Sci., Arts, Lett. 1:150. *pl. 34.* 1923; Shope, Ann. Missouri Bot. Gard. 18:434. *pl. 28, f. 1.* 1931.

**24. Polyporus cristatus** (Pers.) Fries

*P. flavovirens* Berk. and Rav.; *Grifola cristata* (Pers.) S. F. Gray; *G. flavovirens* (Berk. and Rav.) Murr.; *G. poripes* (Fries) Murr.

*Pileus yellowish green* or *yellowish brown.*

**Stem** usually excentric but sometimes central, rarely almost lateral, normally unbranched, more rarely branched, often irregular in form, whitish or yellowish, 2–5 cm. long, 1–2.5 cm. thick; **pileus** fleshy, circular to irregular, convex to plane or depressed, 5–20 cm. broad, 0.3–1.5 cm. thick; surface yellowish green or yellowish brown, sometimes yellow at the center and brown on the margin, becoming cracked and areolate, slightly tomentose to

glabrous, azonate; margin thin and acute, fertile below; **context** white, whitish, or yellow when dry, usually drying firm and fragile, 2–10 mm. thick, the hyphae often branched, thin-walled, very irregular, 5–20 $\mu$ or more in diameter; **tubes** decurrent, whitish, yellowish or brownish, occasionally brick-red on drying, sometimes becoming dark resinous-appearing at the base and separated from the context by a thin dark line when dry, 1–5 mm. long, mouths concolorous, circular to angular, averaging 2–3 per mm., the edges thin, entire; cystidia none; basidia 5.5–8 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, one-guttulate, ovoid to subglobose, 4–6 x 3.5–4.5 $\mu$.

On the ground in woods. Uncommon. Summer and fall.

NYBG; SM; CU; LM; MU.

Illustrations: Hard, Mushrooms, p. 398, *f. 327.* 1908 (as *P. flavovirens*); Lloyd, Synop. Sect. Ovinus, p. 80, *f. 501.* 1911; Overholts, Wash. Univ. Studies 3:84. *pl. 1, f. 5, a–b.* 1915.

*II. Stem few to many times branched, with few large or many small pilei (compare also 23. P. confluens; 24. P. cristatus; and 80. P. borealis).*

MERISMUS. Pilei few to many, proceeding from the branching of a common stem; context white; spores hyaline; usually epixylous.

### 25. Polyporus umbellatus (Pers.) Fries

*Cladomeris ramosissima* (Scop.) Murr.; *Grifola ramosissima* (Scop.) Murr.

*Pilei many, small, centrally attached; spores cylindrical.*

**Stem** "arising from an underground tuber or sclerotium of irregular shape" (Overholts), the part above ground branching repeatedly and terminating in many centrally to subcentrally attached pilei and forming a fruiting body up to 20 cm. in diameter, the branches cylindrical, entirely covered by the decurrent tubes; **pilei** fleshy when fresh, rigid when dry, circular, 1–4 cm. broad, 0.2–0.5 cm. thick; surface whitish to smoky brown, fibrillose to glabrous, azonate; margin thin, acute, fertile below; **context** white, fleshy to fleshy-tough, rather brittle when dry, usually not more than 1 mm. thick, the hyphae often branched, thin-walled, irregular, 4–10 $\mu$ in diameter; **tubes** decurrent, white, brownish when dry, less than 2 mm. long, mouths concolorous, angular, averaging 2–4 per mm., the edges thin, entire to somewhat dentate; cystidia not observed; basidia 5.5–6.5 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, cylindrical, 7–9.5 x 2.5–3.5 $\mu$.

About the bases of stumps or trees. Rather rare. Summer and early fall.

NYBG; SM; CU; CF.

Illustrations: Atkinson, Mushrooms, ed. 3, p. 189, *f. 183.* 1911; Güssow and Odell, Mushrooms and Toadstools, p. 201, *pl. 102.* 1927; Hard, Mushrooms, p. 389, *pl. 44, f. 320.* 1908; Lloyd, Photographs, *Issue No. 25.* 1898, and in Synop. Stip. Polyp., p. 150. *f. 450.* 1912; Overholts, Wash. Univ. Studies 3:86. *pl. 2, f. 7, a–b.* 1915.

### 26. **Polyporus frondosus** (Dicks.) Fries

*Grifola frondosa* (Dicks.) S. F. Gray

*Pilei many, small, laterally attached; spores ellipsoid to ovoid.*

**Stem** branching repeatedly and terminating in many overlapping, laterally attached, stipitate or substipitate pilei, forming a more or less globose fruiting body up to 50 cm. in diameter, the branches white or whitish, expanding into the pilei; **pilei** fleshy-tough when fresh, rigid when dry, flabelliform or spathulate, 2–7 cm. broad, 0.2–0.5 cm. thick; surface grayish to drab, glabrous to minutely tomentose, azonate; margin thin, acute, fertile below; **context** white, fleshy-tough when fresh, firm and fragile when dry, not over 2 mm. thick, the hyphae rarely branched, thin-walled, often collapsing, 3–8 $\mu$ in diameter; **tubes** decurrent, white, 2–3 mm. long, mouths white or whitish, or darkening on drying, angular, variable in size, averaging 1–3 per mm., the edges becoming thin, dentate; cystidia none; basidia 5–5.5 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, ellipsoid to ovoid, 5–6.5 x 3.5–4.5 $\mu$.[1]

About the base of trees or stumps, recorded about chestnut oak and oak unclassified. Occasional. Fall.

SM; CU; LM.

Illustrations: Atkinson, Mushrooms, ed. 3, p. 188, *pl. 67, f. 181,* and p. 189, *pl. 68, f. 182.* 1911; Hard, Mushrooms, p. 391, *f. 321.* 1908; Krieger, Nat. Geogr. Mag. 37:408. 1920; Long, Jour. Agr. Research 1:128, *pl. 8, f. 4.* 1913; McIlvaine, Amer. Fungi, p. 482, *pl. 128.* 1912; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:180. *pl. 12, f. 43.* 1914.

Type of rot: straw-colored rot of oaks, see Long, Jour. Agr. Research 1: 125–127. 1913.

### 27. **Polyporus giganteus** (Pers.) Fries

*Grifola gigantea* (Pers.) Murr.; *G. mesenterica* (Schaeff.) Murr.; *G. Sumstinei* Murr.

*Pilei few, large; tubes white; pores minute; spores smooth.*

**Stem** short and thick, giving rise to a few broad **pilei** which are fleshy-tough, dimidiate to flabelliform or spathulate, 6–15 cm. in diameter, less than 0.5 cm. thick; surface grayish to brownish, often black when dried, minutely tomentose or fibrillose to almost

[1] Overholts (**8,** p. 25) gives the spore size as 6–9 x 4.5–6 $\mu$. Such large spores are occasional in every mount, but they appear to be abnormal, giant spores. The writer has neglected to secure a spore print, and it may be that spores from a spore print are of the larger size. In his latest paper Overholts (**16,** p. 24) gives the spore measurements as 5–7 x 3.5–5 $\mu$.

glabrous, azonate to subzonate; margin very thin, acute; **context** white, fibrous-tough, 1–3 mm. thick, the hyphae rarely branched, thin-walled, 5–8 $\mu$ in diameter; **tubes** white, 1–3 mm. long, mouths white, blackish where bruised and on drying, angular or irregular, averaging 5–7 per mm., the edges thin, entire, becoming lacerate; cystidia none; basidia 8 $\mu$ in diameter; **spores** hyaline, smooth, often one-guttulate, subglobose to globose, 4–6 $\mu$.

On the ground about stumps. Occasional. Summer and fall.

NYBG; SM; CU; LM; CF.

### 28. **Polyporus Berkeleyi** Fries

*P. anax* Berk.; *P. Beatiei* Bann.; *Grifola Berkeleyi* (Fries) Murr.

*Pilei few, large; tubes white; pores large; spores echinulate.*

**Stem** "sometimes, at least, arising from an underground sclerotium or tuber" (Overholts), the part above ground whitish to brownish, short and thick, 3–9 cm. long, 2–5 cm. thick, more or less tuberculate, unbranched or branched, giving rise to 1–5 broad **pilei** which are fleshy-tough when fresh, rigid when dry, more or less circular, 5–25 cm. broad, 0.4–2.5 cm. thick; surface whitish to yellowish, often brownish when dry, glabrous to slightly tomentose or short hispid, sometimes obscurely zoned; margin rather thin, fertile below; **context** white, or brownish in dry specimens, fleshy-tough when fresh, firm and fragile to subcorky when dry, 0.3–2 cm. thick, the hyphae rarely branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** decurrent, white or whitish, 2–8 mm. long, mouths white, whitish, or slightly brownish in dried specimens, angular, irregular, 0.5–2 mm. broad, the edges becoming thin, dentate; cystidia none; basidia 8–10.5 $\mu$ in diameter; **spores** hyaline, echinulate, subglobose to globose, 5.5–8 $\mu$.

Around trees and stumps, recorded only about oak. Uncommon. Summer and fall.

NYBG; SM; CU; LM.

Illustrations: Hard, Mushrooms, p. 393, *f. 323* and p. 394, *pl. 45*. 1908; Lloyd, Photographs, *Issue No. 23–24*. 1898, also Polyp. Issue 3:37. *f. 362*, and p. 39, *f. 363*. 1910; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:180. *pl. 12, f. 41*. 1914 (as *P. anax*); Overholts, Wash. Univ. Studies 3:86. *pl. 2, f. 6*. 1915; Weir, Phytopathology 3:104. *pl. 9*. 1913.

Type of rot: string and ray rot of oaks, see Long, Jour. Agr. Research 1:122–125. 1913; and Weir, Phytopathology 3:101–103. 1913.

### 29. **Polyporus sulphureus** (Bull.) Fries

*P. sulphureus semialbinus* Peck; *Laetiporus sulphureus* (Bull.) Murr.; *L. speciosus* (Batt.) Murr.

*Pilei few to many, large; tubes sulphur-yellow; pores small.*

**Pilei** narrowed at the base and appearing more or less substipitate, fleshy and watery to rather firm, rigid when dry, imbri-

cate, dimidiate to flabelliform, 5–15 x 5–20 x 0.5–2.5 cm.; surface sulphur-yellow to bright orange, often fading with age and becoming brownish or almost white, nearly glabrous, azonate or with broad colored zones; margin thin and acute or thick and obtuse, fertile below; **context** white to light yellow, fleshy when fresh, firm and fragile when dry, 0.4–2 cm. thick, the hyphae much branched, thin-walled, irregular, 5–13 $\mu$ in diameter; **tubes** bright sulphur-yellow, rarely white, or fading with age, 1–4 mm. long, mouths concolorous, angular, averaging 3–4 per mm., the edges rather thin, minutely fimbriate to entire; cystidia none; basidia 5.5–7 $\mu$ in diameter; **spores** hyaline, smooth, ovoid to subglobose, 5–7 x 4–5 $\mu$.

On the stumps and trunks of deciduous trees, recorded on apple, white ash, butternut, chestnut, red oak, scarlet oak, white oak, and oak unclassified. Elsewhere also reported upon coniferous substrata. Rather common. Summer and fall.

NYBG; SM; CU; LM; CF.

Illustrations: Atkinson, Cornell Univ. Agr. Exp. Sta. Bull. 193:208, *f. 64*, and p. 209, *f. 65*. 1901, and in Mushrooms, ed. 3, p. 190, *pl. 69, f. 184*, and *pl. 70, f. 185*. 1911; Baxter, Papers Michigan Acad. Sci., Arts, Lett. 14:290. *pl. 47*. (1930) 1931; Güssow and Odell, Mushrooms and Toadstools, p. 199, *pl. 101, f. 1–3*. 1927; Hard, Mushrooms, p. 397, *f. 326*. 1908; Moffatt, Bull. Nat. Hist. Surv. Chicago Acad. Sci. 7, 1: *pl. 13*. 1909; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:180. *pl. 12, f. 40*. 1914.

Type of rot: brown checked rot, see Hubert (**2,** pp. 363–365); Rankin (**12,** pp. 247–250); and von Schrenk and Spaulding (**13,** pp. 37–39).

*Subsection 2. Context usually yellowish brown or darker, at least when dry.*

*Series 1. Spores brown; cystidia or setae absent.*

PELLOPORUS. Stem central to excentric; context brown; setae none; spores brown; terrestrial, rarely epixylous.

*I. Fruiting body pendant.*

### 30. **Polyporus dependens** Berk. and Curt.

*Polystictus dependens* (Berk. and Curt.) Sacc.; *Coltrichiella dependens* (Berk. and Curt.) Murr.

*Pileus small, reddish brown, silky-striate; pores 1–3 per mm.*

**Stem** central to excentric, enlarging into the pileus, attached at the vertex, surface reddish brown, 1–4 mm. long, 1–3 mm. thick; **pileus** pendant, coriaceous, conical or expanded, very small, 0.2–2.5 cm. broad, 0.5–1 cm. thick; surface reddish brown, silky-striate, subzonate; margin acute, fibrillose to entire, fertile below;

**context** reddish brown, spongy, 0.5–2 mm. thick, the hyphae occasionally to often branched, thin-walled, 4–8 $\mu$ in diameter; **tubes** yellowish brown to reddish brown, 5–8 mm. long, mouths concolorous, angular, 1–3 per mm., the edges thin, entire or toothed; cystidia or setae not observed; basidia not observed; **spores** reddish brown, smooth, ellipsoid, 7–10 x 3.5–5 $\mu$.

On bark and wood of deciduous and coniferous trees, recorded only on pitch pine. Collected at Cutchogue, Long Island, by Roy Latham. This species can be placed in the genus Trametes with equal propriety, as has been done by Baxter (*Papers Michigan Acad. Sci., Arts, Lett.* 14:267. [1930] 1931).

SM; LM.

Illustrations: Baxter, Papers Michigan Acad. Sci., Arts, Lett. 14:290. *pl. 35.* (1930) 1931 (as Trametes); Lloyd, Polyp. Issue 1:13. *f. 207.* 1908 (as Polystictus).

*II. Fruiting body upright.*

**31. Polyporus perennis** (L.) Fries

*P. simillimus* Peck; *Polystictus perennis* (L.) Karst.; *Coltrichia perennis* (L.) Murr.

*Pores small; hyphae 4–6 $\mu$; pileus dull; spores one-guttulate.*

**Stem** central, brown, velvety, 1–4 cm. long, 0.2–0.6 cm. thick; **pilei** sometimes confluent, thin, coriaceous, circular, convex to depressed or umbilicate, 1–7 cm. broad, 0.1–0.35 cm. thick; surface dull to subshiny, grayish brown to cinnamon or rusty brown, finely tomentose, substriate, zonate; margin thin and acute, entire or sometimes fimbriate, fertile or occasionally sterile below; **context** reddish brown, less than 1 mm. thick, the hyphae rarely branched, thin-walled, 4–6 $\mu$ in diameter; **tubes** adnate to decurrent, grayish within, 1–3 mm. long, mouths grayish to cinnamon, angular, averaging 2–4 per mm., the edges thin, finely dentate; setae or cystidia none; basidia 7–9 $\mu$ in diameter; **spores** tinged yellowish brown under the microscope, smooth, cylindric-ellipsoid, one-guttulate, 6.5–8 x 4–5 $\mu$.

On earth, especially burned over soil. Rather common. Summer and fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Atkinson, Mushrooms, ed. 3, p. 192, *f. 187.* 1911 (as Polystictus); Hard, Mushrooms, p. 416, *pl. 47, f. 346.* 1908; Lloyd, Polyp. Issue 1:9, *f. 201.* 1908 (as Polystictus) and in Mycol. Notes 62: *pl. 141, f. 1608–1609.* 1920 (as Polystictus); Overholts, Wash. Univ. Studies 3:90. *pl. 4, f. 19, a–d.* 1915; Shope, Ann. Missouri Bot. Gard. 18:430. *pl. 26, f. 3.* 1931.

**32. Polyporus cinnamomeus** (Jacq.) Fries

*P. splendens* Peck; *P. subsericeus* Peck; *Polystictus cinnamomeus* (Jacq.) Sacc.; *Coltrichia cinnamomea* (Jacq.) Murr.

*Pores small; hyphae 6–12 μ; pileus bright; spores apiculate.*

**Stem** central, unbranched or rarely several fused together, reddish brown, velvety to villous, 1–4 cm. long, 0.2–0.5 cm. thick; **pilei** coriaceous, circular, convex to depressed or umbilicate, sometimes confluent, 1–5 cm. broad, 0.1–0.3 cm. thick; surface bright reddish cinnamon to yellowish brown, usually shiny silky-fibrillose, fibers sometimes erect in the center, striate; margin thin, acute, entire or sometimes fimbriate, fertile or occasionally sterile below; **context** rusty brown, less than 1 mm. thick, the hyphae rarely branched, thin-walled, 6–12 μ in diameter; **tubes** adnate to slightly decurrent, more or less concolorous with the context, not over 2 mm. long, mouths reddish cinnamon, angular, averaging 2–4 per mm., the edges thin, finely dentate; cystidia or setae none; basidia 7–8 μ in diameter; **spores** tinged yellowish brown under the microscope, smooth, laterally apiculate, cylindric-ellipsoid, 6–8 x 4–5 μ.

On soil. Frequent. Summer and early fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Lloyd, Polyp. Issue 1:7. *f. 200.* 1908 (as Polystictus); Shope, Ann. Missouri Bot. Gard. 18:426. *pl. 24. f. 3.* 1931.

**33. Polyporus focicola** Berk. and Curt.

*P. parvulus* Klotsch of most American determinations; *P. parvulus* var. *deformatis* Peck; *Coltrichia focicola* (Berk. and Curt.) Murr.

*Pores large; pileus small, thin; stem slender; spores 3.5–4.5 μ wide.*

**Stem** central, brown, minutely velvety, 1–3 cm. long, 0.2–0.5 cm. thick; **pileus** coriaceous, circular, convex to depressed or umbilicate, 2–4 cm. broad, 0.1–0.6 cm. thick; surface dull grayish brown to cinnamon, rarely rusty red or tawny, finely tomentose, striate, zonate; margin thin, acute, sterile or fertile below; **context** cinnamon brown to reddish brown, fibrous, 0.5 mm. or less thick, the hyphae often branched, thin-walled, 4–8 μ in diameter; **tubes** brown, 1–6 mm. long, mouths concolorous, angular, averaging 1 mm. or more broad, sometimes smaller, the edges becoming thin, finely dentate; cystidia or setae none; basidia 8 μ in diameter; **spores** pale yellowish brown under the microscope, smooth, minutely laterally apiculate, cylindric-ellipsoid, 8–10 x 3.5–4.5 μ.

On earth, especially burnt over soil. Occasional. Summer and fall.

NYBG; SM; LM.

Illustrations: Lloyd, Polyp. Issue 1:10. *f. 203–204.* 1908 (as Polystictus).

### 34. Polyporus Montagnei Fries

*Polystictus obesus* Ell. and Everh.; *Coltrichia obesa* (Ell. and Everh.) Murr.; *C. Montagnei* (Fries) Murr.

*Pores large; pileus large, thick; stem thick; spores 4–7 μ wide.*

**Stem** central to subcentral, brown, soft and tomentose, 2–5 cm. long, 0.5–2 cm. thick; **pileus** soft and spongy when fresh, rigid when dry, convex, 4–10 cm. broad, 0.2–0.7 cm. thick; surface yellowish cinnamon to rusty brown, tomentose or fibrillose especially toward the margin, sometimes with short coarse erect proliferations at the center, usually faintly zonate; margin becoming thin, acute, usually sterile below; **context** yellowish brown to reddish brown, soft and friable when dry, 1–5 mm. thick, the hyphae somewhat branched, thin-walled, 5–12 μ in diameter; **tubes** decurrent, whitened within, 1–5 mm. long, mouths white or light tan to dark brown, at first circular, soon angular to daedaloid, averaging 0.5–1.5 mm. broad, the edges at first thick, soon becoming thin, entire; cystidia or setae none; basidia 5.5–9.5 μ broad; **spores** pale brown, smooth, cylindric-ellipsoid to broadly ellipsoid, 7–11.5 x 4–7 μ.

On the ground attached to buried wood, or on old stumps of coniferous trees. Rare. Summer and fall.

NYBG; SM; CU.

Illustrations: Lloyd, Polyp. Issue No. 1, p. 11, *f. 205.* 1908 (as *Polystictus cuticularis*, see correction in note 195, Lloyd Letter 53:15. 1914).

*Series 2. Spores hyaline; cystidia or setae present.*

SPONGIOSUS (BROWN). Stem central to lateral, or wanting; context brown, soft and spongy to firm, usually duplex; setae or cystidia present; spores hyaline; usually epixylous.

### 35. Polyporus Schweinitzii Fries

*P. hispidoides* Peck; *Phaeolus sistotremoides* (Alb. and Schw.) Murr.

*Context homogeneous; cystidia brown, club-shaped; pores 1–3 per mm.*

**Stem** central, excentric, lateral, or wanting, surface yellowish to brown, tomentose to nearly glabrous, up to 6 cm. long, 1–4 cm. thick; **pileus** spongy or soft-corky when fresh, fragile when dry, convex to umbonate or infundibuliform, dimidiate or reniform to circular, 5–25 cm. broad, 0.3–1.5 cm. thick; surface ochraceous to orange or yellowish brown to rusty brown, strigose-tomentose to nearly glabrous, azonate to zonate; margin concolorous or lighter, often finely velvety-tomentose, sterile below; **context** yellowish to reddish brown, soft and spongy when fresh, drying firm and fragile, 0.2–1 cm. thick, the hyphae often branched, thin-walled, 6–12 μ in diameter; **tubes** decurrent, orange-yellow when young, with age becoming concolorous with the upper surface, 1–6 mm.

long, mouths more or less concolorous, darker where bruised, circular to angular, soon becoming irregular, averaging 1–3 per mm., the edges rather thin, dentate with age, occasionally breaking down and resulting in extra large pores; **cystidia** brown, usually club-shaped, up to 12 $\mu$ in diameter, projecting up to 60 $\mu$; basidia 6–8 $\mu$ in diameter; **spores** hyaline, smooth, ellipsoid to ovoid, 6–8 x 4–5 $\mu$.

On or about the stumps or trunks of coniferous trees, recorded on hemlock, larch, pitch pine, white pine, black spruce, Norway spruce, and spruce unclassified. Common. Summer and fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Boyce, U. S. Dept. Agr. Bull. 1163, *pl. 5, f. 1.* 1923; Weir, Bull. Vocational Educat. (Idaho) 5, No. 5, p. 37, *f. 5.* 1922; Lloyd, Polyp. Issue 1:14, *f. 208.* 1908; Meinecke, Manual Forest Tree Dis. *pl. 13.* 1914; Shope, Ann. Missouri Bot. Gard. 18:428. *pl. 25. f. 1–2.* 1931.

Type of rot: red-brown butt and root rot of conifers, see Hubert (**2,** pp. 355–363); and Rankin (**12,** pp. 294–296).

### 36. **Polyporus circinatus** Fries

*P. circinatus* var. *proliferus* Peck; *P. tomentosus* Fries sense most American writers, not Fries; *Coltrichia tomentosa* (Fries) Murr.

*Context duplex; setae usually straight; spores 4.5–5.5 $\mu$ long.*

**Stem** central or excentric, rarely lateral, sometimes very short, surface ochraceous to brown, tomentose, up to 4 cm. long, 0.5–2 cm. thick; **pilei** sometimes proliferating from the surface of other pilei, each pileus subcoriaceous when fresh, rather rigid when dry, circular to flabelliform, plane to depressed at the center, 3–10 cm. broad, 0.3–2 cm. thick; surface whitish when young, soon becoming ochraceous to yellowish brown or darker, tomentose or soft velvety, azonate to indistinctly zonate; margin acute, usually sterile below; **context** ochraceous to yellowish brown, turning bright brownish red in KOH solution, duplex, soft and spongy above, firm next the tubes, 1–15 mm. thick, the hyphae similar in both tissues, sparingly branched, thin-walled, 4–7 $\mu$ in diameter; **tubes** short decurrent, light brown, usually whitish within, 1–4 mm. long, mouths grayish or brown, circular to angular, averaging 2–4 per mm., the edges moderately thick, usually entire; **setae** normally abundant, usually straight, projecting up to 60 $\mu$, 8–12 $\mu$ in diameter; basidia 4–5.5 $\mu$ in diameter; **spores** hyaline, smooth, slightly apiculate, ellipsoid to cylindric-ellipsoid, 4.5–5.5 x 3–4 $\mu$.

On the ground attached to buried wood, recorded about stumps of balsam, hemlock, pitch pine, pine unclassified, and spruce. Frequent. Summer and fall.

NYBG; SM; CU; LM; MU.

Illustrations: Hubert, Outl. For. Path. p. 352, *f. 92 A.* 1931; Lloyd, Polyp. Issue 1, p. 5, *f. 198.* 1908 (as Polystictus); Neuman,

Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:182. *pl. 13, f. 49, a–b.* 1914; Shope, Ann. Missouri Bot. Gard. 18:430. *pl. 26, f. 1–2.* 1931.

Type of rot: white pocket rot of the roots and butt sections of conifers, see Hubert, Phytopathology 19:745–747. 1929, or in (**2**, pp. 351–355).

### 37. **Polyporus dualis** Peck

*P. circinatus* var. *dualis* Peck

*Context duplex; setae strongly curved; spores 6–7 μ long.*

**Pileus** sessile or laterally substipitate with a short rudimentary stem, rigid, flabelliform, or dimidiate, solitary or caespitose-imbricate, 2.5–6 x 3–9 x 0.5–1.2 cm.; surface yellowish brown to reddish brown, soft, velutinate, azonate or nearly so; margin thin to thick, acute to obtuse, sterile below; **context** yellowish brown, duplex, firm-fibrous next the tubes, soft and spongy above, the two parts of about equal thickness, the whole 2–8 mm. thick, the hyphae from next the tubes rarely branched, thin-walled, 4–5.5 μ in diameter; **tubes** brown, slightly whitened within, 2–5 mm. long, mouths concolorous, rather irregular, often uniting radially near the margin giving a somewhat lamellate appearance, averaging 1–3 per mm., sometimes the mouths larger, up to 1.5 mm. broad, the edges thin, entire; **setae** abundant, strongly curved, 10–17 μ in diameter, projecting up to 70 μ; basidia not observed; **spores** hyaline, smooth, ellipsoid to ovoid, 6–7 x 4–5.5 μ.

On the wood of coniferous trees, recorded on spruce and hemlock. Rare. The species is usually placed in synonymy with *P. circinatus* but it seems distinct with its peculiarly curved setae, its sessile to subsessile habit of growth, and its larger spores. According to Lloyd (**4**, p. 161) it is the same as *P. leporinus* Fries of Europe. In the one European specimen examined the same peculiar setae were present. The published spore measurements of the European species appear to agree with the measurements here given. Until more European specimens have been examined, however, it seems best to use the American name.

NYBG; SM; LM; MU.

Illustrations: Lloyd, Polyp. Issue 1:6. *f. 199.* 1908 (as Polystictus).

*Section II. Fruiting body sessile or effused-reflexed, rarely resupinate or substipitate (except laterally stipitate 59. P. rhipidium).*

APUS. Pileus sessile or effused-reflexed, rarely resupinate or substipitate; context white, bright colored, or brown; cystidia or setae present or absent; spores hyaline or colored.

*Subsection 1. Context light brown to dark brown; spores hyaline or colored.*

*Series 1. Spores colored, greenish yellow or brownish.*

### 38. **Polyporus hispidus** (Bull.) Fries

*Inonotus hirsutus* (Scop.) Murr.

*Spores brown, 7–9.5 x 6–7 μ; pileus hirsute to hispid-tomentose.*

**Pileus** sessile, soft and watery when fresh, firm to rigid when dry, sometimes imbricate, dimidiate, 5–20 x 10–25 x 2–5 cm.; surface yellowish brown to rusty brown, densely hirsute to hispid-tomentose, azonate; margin thick to thin, obtuse to acute, fertile below; **context** usually light yellowish brown above and dark reddish brown next the tubes, or concolorous throughout, fibrous when fresh, firm and fragile when dry, 1–4 cm. thick, the hyphae somewhat branched, 6–10 μ in diameter, of two kinds: some very dark and usually thick-walled, others lighter colored, thin-walled; **tubes** yellowish brown or darker, 0.5–1.5 cm. long, mouths yellowish brown, becoming darker where bruised and on drying, angular, averaging 2–4 per mm., the edges thin, entire; cystidia or setae usually none[1]; basidia 9–11 μ in diameter; **spores** yellowish brown, smooth, one-guttulate, ellipsoid to broadly ovoid, 7–9.5 x 6–7 μ.

On living trunks of deciduous trees, recorded on black oak, chestnut oak, pin oak, and oak unclassified. Occasional. Fall.

NYBG; SM; CU; LM.

Illustrations: Baxter, Papers Michigan Acad. Sci., Arts, Lett. 3:50. *pl. 8.* (1923) 1924.

Type of rot: heartrot of ash, see Baxter, Papers Michigan Acad. Sci. Arts, Lett. 3:39–50. 1924, and in Amer. Jour. Bot. 12:522–576. 1925 (biology); Graves, Mycologia 11:119, 120. 1919; Nutman, Ann. Appl. Biol. 16:40–64. 1929.

### 39. **Polyporus glomeratus** Peck

*Inonotus glomeratus* (Peck) Murr.; *I. radiatus* (Sow.) Karst. of No. Amer. Flora 9:90. 1908 in part.

*Spores greenish yellow; context and trama with large setae-like bodies; pileus usually effused-reflexed, becoming glabrous.*

**Pileus** sessile or more often effused-reflexed, sometimes resupinate, corky to rigid, usually laterally united, 2–4 x 2–10 x 0.4–2 cm.; surface dark yellowish brown but often greenish yellow from the spores, minutely velvety, becoming glabrous, at length covered with a distinct hard crust, rough and more or less uneven, azonate; margin acute to obtuse, narrowly sterile below; **context** yellowish brown, spongy when fresh, firm and fragile to subwoody when dry, 0.3–1 cm. thick, the hyphae rarely branched, thin-walled, 3–5 μ in diameter; **tubes** sometimes in two layers, brown or olivaceous brown within, 3–9 mm. long, mouths gray, brown, or greenish yellow, angular, 4–6 per mm., the edges thin, entire; context and trama with elongated, pointed, setae-like bodies 8–21 μ in diameter;

[1] The general character of the fruiting body indicates a close relationship to the species which bear setae in the hymenium. Very rarely a typical seta may be found, but for practical taxonomic purposes the species should be considered as lacking setae.

**setae** present or absent, sometimes abundant, subulate, 4.5–6 $\mu$ in diameter, projecting up to 16 $\mu$; basidia 5.5–6 $\mu$ in diameter; **spores** greenish yellow in mass, yellowish under the microscope, smooth, subglobose to globose, 5–6 x 4.5–5 $\mu$.

On the wood of deciduous trees, recorded on beech, red maple, silver maple, sugar maple, maple unclassified, and on Abies (doubtful). Rare. Sometimes perennial. A full account of the structure of the species is given by Overholts in *Torreya* 17: 202–206. 1917.

NYBG; SM; CU; CF; MU.

Illustrations: Overholts, Torreya 17: 204. *pl. 1, f. 1.* 1917.

Type of rot: rot of hardwoods, see J. R. Weir, Fifteenth Ann. Rept. Indiana State Board Forestry, p. 162. 1915 (under *Poria xanthopora*); and D. V. Baxter, Papers Michigan Acad. Sci., Arts, Lett. 9: 39, 40. (1928) 1929.

### 40. Polyporus cuticularis (Bull.) Fries

*Inonotus cuticularis* (Bull.) Karst.; *I. perplexus* (Peck) Murr. in No. Amer. Flora 9:88. 1908 in part.

*Spores brown, 5.5–7.5 x 4–5.5 $\mu$; pileus woolly-tomentose or fibrillose.*

**Pileus** sessile, spongy and fleshy-tough when fresh, often imbricate, dimidiate to flabelliform, 3–7 x 3–10 x 0.3–1 cm.; surface yellowish brown to rusty brown, compactly woolly-tomentose or becoming fibrillose, when old varying to almost glabrous, at least in part, zoned when young, usually becoming azonate; margin thin, acute, fertile below; **context** yellowish brown to rusty brown, tough and watery when fresh, distinctly fibrous, fibrous-fragile when dry, 2–7 mm. thick, the hyphae frequently branched, thin-walled, 6–10 $\mu$ in diameter; **tubes** brown, 2–7 mm. long, mouths grayish brown to rusty brown, angular, averaging 3–5 per mm., the edges thin, entire to fimbriate or lacerate; **setae** abundant to scarce, sharp-pointed, 5–9 $\mu$ in diameter; basidia 6–8 $\mu$ in diameter; **spores** yellowish brown, smooth, broadly ellipsoid to subglobose, 5.5–7.5 x 4–5.5 $\mu$.

On the wood of deciduous trees, recorded on beech, shagbark hickory, silver maple, sugar maple, maple unclassified, and poplar. Rather common. Summer and fall.

NYBG; SM; CU; LM; CF.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 360, *f. 693,* p. 361, *f. 694.* 1915; Overholts, Wash. Univ. Studies 3: 92. *pl. 5, f. 26.* 1915.

### 41. Polyporus Rheades (Pers.) Fries

*P. corruscans* Fries; *P. dryophilus* Berk.; *Inonotus dryophilus* (Berk.) Murr.

*Spores brown; context with a more or less globose granular core.*

**Pileus** sessile, somewhat fleshy when young, firm when mature, ungulate to subglobose, or tubercular, imbricate or solitary, 3–10

x 5–20 x 3 10 cm.; surface grayish brown to reddish brown, fibrillose, then scabrous, finally almost glabrous, zonate to azonate; margin thick, usually obtuse, sterile below; **context** light yellowish brown to dark reddish brown, outer layer zonate, soft when fresh, hard and fibrous when dry, 0.2–1.5 cm. thick, inner portion a more or less globose granular core 3–10 cm. thick, permeated with white mycelial strands, the hyphae of the outer context rarely branched, rather thick-walled, 5–8 $\mu$ in diameter; **tubes** usually concolorous with the context, 0.3–3 cm. long, mouths cinnamon brown, circular to angular, averaging 2–3 per mm., the edges thin, becoming slightly lacerate; **setae** "when present dark brown, sharp pointed, projecting 10–20 $\mu$" (Overholts); basidia 5–8 $\mu$ in diameter; **spores** brown, smooth, ellipsoid to subglobose, 5.5–7 x 4.5–5.5 $\mu$.

On living (rarely dead) trees, recorded only on white oak. Rare. Summer and fall.

NYBG; SM; LM.

Illustrations: Hedgcock and Long, Jour. Agr. Research 1:250. *f. 1–3, 7* (upside down), *8.* 1913 (as *P. dryophilus*), and in vol. 3:78. *pl. 9, 10.* 1914 (as *P. dryophilus*); Lloyd, Mycol. Notes 35:467. *f. 333.* 1910, also in Synop. Apus Polyporus, p. 362, *f. 696.* 1915, and in Mycol. Notes 53:755. *f. 1129.* 1918; Shope, Ann. Missouri Bot. Gard. 18:420. *pl. 21, f. 5–6.* 1931.

Type of rot: heartrot of oaks and poplars, see Hedgcock and Long, Jour. Agr. Research 3:65–78. 1914; and Hedgcock, Phytopathology 2:73–74. 1912.

*Series 2. Spores hyaline or nearly so.*
*I. Setae present (compare also 37. P. dualis).*

### 42. Polyporus dryadeus (Pers.) Fries

*Inonotus dryadeus* (Fries) Murr.

*Spores 7–8 x 5.5–7 $\mu$; pores 3–5 per mm.; pileus large, applanate.*

**Pileus** sessile, spongy and watery when fresh, more or less corky or woody when dry, dimidiate, applanate, 6–30 x 8–35 x 2–6 cm.; surface grayish brown or darker, glabrous, azonate; margin thick and obtuse, "distilling drops of water when young" (Overholts), usually narrowly sterile below; **context** dark brown or rusty brown, soft and watery when fresh, corky to woody on drying, subshiny and faintly zonate when dry, 1.5–4 cm. thick, the hyphae rarely branched, thin- to rather thick-walled, 4–7 $\mu$ in diameter; **tubes** slightly lighter colored than the context, 0.3–2 cm. long, mouths grayish brown or darker, circular, becoming angular, averaging 3–5 per mm., the edges thin, entire to fimbriate or lacerate; **setae** abundant to rare, usually curved, 6–12 $\mu$ in diameter, projecting up to 30 $\mu$; basidia not observed; **spores** hyaline or nearly so, smooth, apiculate, ovoid to subglobose, 7–8 x 5.5–7 $\mu$.

On living trunks, usually of oak, recorded on elm and oak. Rare. Late summer and fall.

CU; LM.

Illustrations: Long, Jour. Agr. Research 1:250. *pl. 21, f. 1* and *pl. 22, f. 4.* 1913; Lloyd, Mycol. Notes 36:491. *f. 383.* 1910; Rankin, Man. Tree Diseases, p. 262, *f. 51.* 1923.

Type of rot: white saprot and heartrot in the roots of oak, see Long, Jour. Agr. Research 1:239–250. 1913, and in Phytopathology 3:285–287. 1913.

**43. Polyporus gilvus** (Schw.) Fries

*Hapalopilus gilvus* (Schw.) Murr.

*Spores 4–6 x 3–4 μ; pores 5–8 per mm.; hyphae 3–5 μ; setae abundant.*

**Pileus** sessile or effused-reflexed, sometimes resupinate, leathery to corky or rigid, often imbricate, dimidiate, 1–8 x 3–15 x 0.2–2.5 cm.; surface yellowish brown to reddish brown, somewhat pubescent when young, glabrous when mature, usually rough, sometimes scrupose; margin acute, narrowly sterile below; **context** yellowish brown, soft-corky when fresh, woody when dry, faintly zonate, 0.1–2.5 cm. thick, the hyphae rarely branched, medium thick- to thick-walled, 3–5 μ in diameter; **tubes** brown, sometimes stratified, 1–12 mm. long, mouths reddish brown to dark brown, circular to angular, averaging 5–8 per mm., the edges rather thick, entire; **setae** abundant, subulate, projecting 10–16 μ, 4–7 μ in diameter; basidia 4.5–5.5 μ in diameter; **spores** hyaline, smooth, cylindric-ellipsoid, one-guttulate, 4–6 x 3–4 μ.

On the wood of deciduous or rarely of coniferous trees, recorded on beech, male berry, birch, fire cherry, cherry unclassified, elm, maple, chestnut oak, white oak, oak unclassified, and cedar. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hirt, N.Y.S. Coll. Forestry Tech. Publ. 22: *pl. 1, f. 1–2.* 1928; Moffatt, Bull. Nat. Hist. Surv. Chicago Acad. Sci. 7, I; *pl. 15, f. 2.* 1909; Overholts, Wash. Univ. Studies 3:92. *pl. 5, f. 25.* 1915.

Type of rot: white rot of the sapwood and heartwood of deciduous trees, see Hirt, N.Y.S. Coll. Forestry Tech. Publ. 22. 1928 (biology).

**44. Polyporus radiatus** (Sow.) Fries

*P. aureonitens* Pat. and Peck; *Inonotus radiatus* (Sow.) Karst. of No. Amer. Flora 9:90. 1908 in part.

*Spores 4–5 x 3–4 μ; pores 4–5 per mm.; hyphae 4–7 μ.*

**Pileus** sessile, rather firm and rigid, dimidiate or flabelliform and attached by a narrowed base, 2–5 x 2–7 x 0.3–1.5 cm.; surface yellowish brown to rusty brown, velvety to glabrous, usually zonate, sometimes azonate; margin thin to thick, acute, fertile below; **context** yellowish brown to rusty brown, corky to subwoody, fibrous, zonate, 2–10 mm. thick, the hyphae rarely branched,

thin- to rather thick-walled, 4–7 $\mu$ in diameter; **tubes** brownish to rusty brown, 1–8 mm. long, mouths grayish brown to rusty brown, circular, becoming angular, averaging 4–5 per mm., the edges rather thin, entire; **setae** usually rare, ventricose, straight to curved, 4–10 $\mu$ in diameter, projecting 5–10 $\mu$; basidia 5–6.5 $\mu$ in diameter; **spores** hyaline, smooth, ellipsoid, 4–5 x 3–4 $\mu$.

On the wood of deciduous trees, usually on alder or birch, recorded on smooth alder, alder unclassified, beech, yellow birch, birch unclassified, and mountain maple. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 351, *f.* 688. 1915.

*II. Setae absent (compare also 70. P. planellus and 79. P. robiniophilus).*

### 45. Polyporus rutilans (Pers.) Fries

*P. nidulans* Fries; *Hapalopilus rutilans* (Pers.) Murr.

*Spores ellipsoid to ovoid; context violaceous in KOH solution.*

**Pileus** sessile or effused-reflexed, soft and spongy when fresh, firm and fragile when dry, dimidiate, 2–5 x 2–8 x 0.5–2 cm.; surface cinnamon to yellowish brown or dark brown, velvety or fibrillose to glabrous, azonate; margin purplish or reddish where bruised, thin and acute, fertile below; **context** concolorous with the pileus, soft and watery when fresh, soft and friable when dry, turning violaceous, then colorless, when touched with KOH solution, 2–15 mm. thick, the hyphae frequently branched, thick-walled, 4–6 $\mu$ in diameter; **tubes** concolorous, whitish incrusted within, 2–7 mm. long, mouths grayish to yellowish brown or reddish brown, angular or sinuous, averaging 3–4 per mm., the edges thin, entire; cystidia or setae none; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, ellipsoid to ovoid, 2.5–4 x 2.5–3 $\mu$.

On the wood of deciduous trees, especially oak and hickory, recorded on beech, yellow birch, hickory, black oak, and oak unclassified. Common. Summer and fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 335, *f.* 67 *t.* 1915.

### 46. Polyporus resinosus (Schrad.) Fries

*P. benzoinus* (Wahl.) Fries; *P. fuscus* (Pers.); *Ischnoderma fuliginosa* (Scop.) Murr.

*Spores allantoid; pileus large, brown with darker bands.*

**Pileus** sessile or effused-reflexed, watery and fleshy when young, corky when mature, imbricate or solitary, dimidiate, 5–15 x 5–20 x 0.8–2.5 cm.; surface cinnamon brown to blackish brown, minutely hispid or velvety-tomentose to glabrous, zonate with more or less

distinct darker bands; margin usually rather thick, acute to obtuse, fertile below; **context** very light brown, drying firm and fragile, 0.5-2 cm. thick, the hyphae sparingly branched, thick-walled, 4–6 $\mu$ in diameter; **tubes** concolorous with the context, 1–6 mm. long, mouths white to pallid, darker where bruised and on drying, circular to angular, averaging 4–6 per mm., the edges thin, entire to dentate or lacerate; cystidia or setae none; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, allantoid, 5–7 x 1–2 $\mu$.

On old logs and stumps of deciduous and coniferous trees, recorded on basswood, beech, maple, oak, hemlock, and white pine. Common. Summer and fall. Lloyd (**6,** p. 334) considers the form on coniferous hosts *(P. benzoinus)* distinct from the form on deciduous substrata *(P. fuscus)*. Snell *et al.* (*Mycologia* 20: 279–281. 1928) have shown that the cultural characteristics are quite similar for both. They are here considered to be forms of the same species.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hard, Mushrooms, p. 403, *f. 331.* 1908; Moffatt, Bull. Nat. Hist. Surv. Chicago Acad. Sci. 7, I: *pl. 15, f. 1.* 1909; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33: 178. *pl. 11, f. 37.* 1914; Shope, Ann. Missouri Bot. Gard. 18: 422. *pl. 22, f. 2.* 1931.

### 47. Polyporus graveolens (Schw.) Fries

*Fomes graveolens* (Schw.) Cooke; *Globifomes graveolens* (Schw.) Murr.

*Fruiting body with a granular core; pilei many, small, overlapping.*

**Fruiting body** a sessile, globose or cylindrical mass 4–20 cm. in diameter, arising from a central, granular, solid core, with numerous overlapping pilei, the **pilei** sessile, conchate, laterally confluent, 0.5–3 cm. long, 0.2–0.6 cm. thick; surface grayish brown to cinnamon brown or grayish black, slightly incrusted, pulverulent or glabrous; margin bent downward and concealing the pores, thin, sterile or fertile below; **context** yellowish brown, floccose-fibrous, 1–4 mm. thick, the hyphae thick-walled, the larger (4–8 $\mu$ in diameter) rarely branched, the smaller (2.5–4 $\mu$) occasionally to often branched; **tubes** concolorous, 2–4 mm. long, mouths grayish brown to dark brown, circular, averaging 3–4 per mm., the edges thick, entire; cystidia or setae none but incrusted ends of hyphae sometimes project from the hymenium; basidia not observed; **spores** "cylindric, smooth, hyaline, 9–10 x 2.5–3.5 $\mu$" (Overholts).

On logs and trunks of deciduous trees, recorded only on living red oak. Rare. Summer. The fruiting body is said to sometimes have a sweet odor when growing and is known as "sweet knot."

NYBG; CU.

Illustrations: Hard, Mushrooms, p. 405, *f. 334.* 1908 (upside down); Graves, Mycologia 11:124. *pl. 10, f. 3.* 1919; Lloyd, Polyp. Issue 3:42, *f. 367* (upside down), and p. 43, *f. 368.* 1910, and in Synop. Stip. Polyp., p. 155. *f. 155.* 1912; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:182. *pl. 13, f. 44, a–b.* 1914; Overholts, Wash. Univ. Studies 3:92. *pl. 5, f. 24.* 1915.

Type of rot: heartrot of oak, see Graves, Mycologia 11:118. 1919.

*Subsection 2. Context reddish, orange, pinkish, or yellowish; spores hyaline (compare also 29. P. sulphureus; 107. Trametes subrosea; and 131. Fomes fraxineus).*

### 48. Polyporus sanguineus (L.) Fries

*Pycnoporus sanguineus* (L.) Murr.

*Pores small, cinnabar-red; pileus thin, coriaceous; on hardwoods.*

**Pileus** sessile, dimidiate, or attenuate at the base and appearing substipitate, coriaceous, 2–6 x 2–10 x 0.2–0.4 cm.; surface bright red, sometimes fading, finely tomentose to glabrous, often indistinctly zonate; margin very thin, narrowly sterile below; **context** red or yellowish red, floccose-fibrous, up to 2.5 mm. thick, the hyphae rarely branched, thick-walled, 3–6 $\mu$ in diameter; **tubes** red, 0.5–1.5 mm. long, the mouths cinnabar-red, circular when young, becoming more or less angular, averaging 3–5 per mm., the edges thin, entire; cystidia none; basidia 5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 3–5 x 1.5–2 $\mu$.

On the wood of deciduous trees. Reported by Peck on three occasions but no specimens were found at Albany.

This species differs from *P. cinnabarinus* only in the thickness of the pileus, and Weir (*Mycologia* 11:64. 1919) suggests that the two species may be identical.

### 49. Polyporus cinnabarinus (Jacq.) Fries

*Pycnoporus cinnabarinus* (Jacq.) Karst.; *Trametes cinnabarina* (Jacq.) Fries

*Pores small, cinnabar-red; pileus thick, corky; on hardwoods.*

**Pileus** sessile, more or less corky to rigid, dimidiate to flabelliform, 2–6 x 2–10 x 0.5–2 cm.; surface orange to cinnabar-red, often paler with age, tomentose to glabrous, azonate; margin thin, acute, sterile below; **context** red to yellowish red, turning yellowish brown in KOH solution, floccose-fibrous to soft-corky, zonate, 0.4–2 cm. thick, the hyphae sparingly branched, thick-walled, 3–8 $\mu$ in diameter; **tubes** concolorous with the context or slightly darker, 1–4 mm. long, mouths cinnabar-red, circular, angular, or daedaloid, averaging 2–4 per mm., the edges thick to rather thin, entire; cystidia none; basidia 6–7 $\mu$ in diameter; **spores** "oblong, smooth, hyaline, 4.5–5.5 x 2–2.5 $\mu$" (Overholts), "5–7 x 2–3 $\mu$" (Shope).

On the wood of deciduous or rarely of coniferous trees, often on cherry, recorded on yellow birch, birch unclassified, wild black cherry, fire cherry, sweet cherry, cherry unclassified, chestnut, hickory, maple, hemlock, pine, and red spruce. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hard, Mushrooms, p. 409, *f. 338*. 1908; Murrill, Mycologia 10:107. *pl. 6, f. 1.* 1918; Shope, Ann. Missouri Bot. Gard. 18:426. *pl. 24, f. 1.* 1931.

**50. Polyporus fibrillosus** Karst.

*P. aurantiacus* Peck; *Inonotus fibrillosus* Karst.; *Pycnoporellus fibrillosus* (Karst.) Murr.

*Pores 1–2 per mm.; spores 5–7 x 3–4 μ; on coniferous wood.*

**Pileus** sessile or effused-reflexed, soft and spongy when fresh, firm-fragile when dry, imbricate, dimidiate, 2–5 x 3–6 x 0.4–3 cm.; surface orange red to orange brown, fibrous tomentose, sometimes faintly zonate; **context** concolorous with the surface of the pileus or slightly lighter in color, watery-tough when fresh, spongy-fragile to firm-corky when dry, zonate, turning bright orange red in KOH solution, 0.3–2 cm. thick, the hyphae often branched, usually thick-walled, sometimes thin-walled, 4–10 μ in diameter; **tubes** concolorous with the context, 2–5 mm. long, mouths cream colored to light orange, angular, unequal, 1–2 per mm., the edges rather thin, becoming lacerate; **cystidia** hyaline, cylindrical, 4–5 μ in diameter, projecting up to 60 μ; basidia 4–6 μ in diameter; **spores** hyaline, smooth, sometimes apiculate, cylindric-ellipsoid, 5–7 x 3–4 μ.

On the wood of coniferous trees, recorded on balsam, hemlock, spruce, and yellow birch (doubtful). Rather rare. Summer.

NYBG; SM; LM; CF; MU.

Illustrations: Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:178. *pl. 11, f. 35, a–c.* 1914 (as *P. aurantiacus*); Shope, Ann. Missouri Bot. Gard. 18:412. *pl. 17, f. 4–5.* 1931.

**51. Polyporus alboluteus** Ell. and Everh.

*Aurantiporellus alboluteus* (Ell. and Everh.) Murr.; *Lenzites sepiaria* var. *dentifera* Peck

*Pores 1–3 mm. broad; spores 8–10 x 2.5–3.5 μ; on coniferous wood.*

**Pileus** effused-reflexed or resupinate, soft and spongy, easily separable, 0–4 x 3–10 x 1.5–4 cm.; surface orange, with age becoming incrusted and turning black, or bleaching to almost white, velvety, azonate; **context** orange to yellowish orange, very soft and spongy, becoming bright red when touched with KOH solution, 0.5–3 cm. thick, the hyphae frequently branched, thin-walled, 4–10 μ in diameter; **tubes** concolorous, 1–3 cm. long, mouths yellowish or orange, sometimes turning black where bruised, angular,

1–3 mm. or more broad, the dissepiments thin, often splitting and becoming tooth-like, or poroid and edges lacerate with age; **cystidia** "abundant, hyaline, cylindric, 7–9 $\mu$ in diameter, often collapsed, projecting up to 60 $\mu$" (Shope); basidia not observed; **spores** "cylindric, smooth, hyaline, 8–10 x 2.5–3.5 $\mu$" (Overholts).

On the wood of coniferous trees, recorded only on spruce. Very rare, once collected, Adirondacks, C. H. Peck. Summer. The species is typically western.

SM.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 340, *f. 678.* 1915; Shope, Ann. Missouri Bot. Gard. 18: 416. *pl. 19, f. 1–4.* 1931.

**52. Polyporus croceus** (Pers.) Fries

*P. hypococcinus* Berk.; *P. Pilotae* Schw.; *Aurantiporus croceus* (Pers.) Murr.; *A. Pilotae* (Schw.) Murr.

*Pores small, orange, often drying black, agglutinated; pileus watery, drying rigid; context drying zonate; on hardwoods.*

**Pileus** sessile, watery and rather soft when fresh, rigid when dry, dimidiate, 5–10 x 5–15 x 1–5 cm.; surface buff to orange when fresh, fading on drying, minutely tomentose to glabrous, azonate; margin usually obtuse, sterile below; **context** pale buff when fresh, sordid flesh color to dark red, hard, fibrous, and strongly zonate when dry, 0.7–3 cm. thick, the hyphae rarely branched, thin-walled, incrusted, 3–5 $\mu$ in diameter; **tubes** orange, sometimes remaining so but more often becoming brownish to black, resinous, and agglutinated on drying, 0.5–2 cm. long, mouths concolorous, angular, averaging 3–5 per mm., the edges becoming thin, lacerate; cystidia none; basidia not observed; **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, 4.5–5.5 x 2.5–3 $\mu$.

On the wood of deciduous trees, recorded on chestnut and oak. Very rare. Summer and fall.

When dry compare 83. *P. fissilis.*

SM.

Illustrations: Long, Jour. Agr. Research 1: 128. *pl. 7, f. 1.* 1913 (as *P. Pilotae*).

Type of rot: pocketed or piped rot in oak and chestnut, see Long, Jour. Agr. Research 1: 114–122. 1913.

*Subsection 3. Context white or whitish when fresh, rarely light brown; spores hyaline (except bluish gray in 89. P. caesius).*

*Series 1. Pore surface surrounded by a volva.*

**53. Polyporus volvatus** Peck

*P. volvatus* var. *typicus* Peck; *P. volvatus* var. *obvolutus* (Berk. and Cooke) Peck; *Cryptoporus volvatus* (Peck) Shear

*Pileus more or less globose; volva opening by one or a few pores.*

**Pileus** sessile, or very rarely attached by a stem-like base, corky to woody, globose to compressed-globose, 1–5 cm. broad, 1–4 cm.

thick; upper surface at first resinous, whitish or yellowish or tinged with red, the resinous secretion soon flaking off; margin rounded and continuous with the volva; **volva** at first unbroken, later developing one to a few openings; **context** white or pallid, soft-corky when dry, 2–10 mm. thick, the hyphae rarely branched, thick-walled, 3–7 $\mu$ in diameter; **tubes** at first white, darkening with age, narrowed at the mouths, 2–5 mm. long, mouths white when young, darkening to chocolate with age, circular to angular, averaging 3–4 per mm., the edges thick, entire; cystidia none; basidia "6–8 $\mu$ in diameter" (Shope); **spores** hyaline, smooth, cylindric-ellipsoid, 10–13 x 4.5–5.5 $\mu$.

On the bark and wood of coniferous trees, recorded on balsam, pitch pine, black spruce, and red spruce. Uncommon. Spring and summer. Ellipsoid to pyriform conidia are reported for this species by Zeller (*Mycologia* 7:121–125. 1915).

NYBG; SM; CU; LM; CF.

Illustrations: Hard, Mushrooms, p. 411, *f. 340.* 1908; Lloyd, Polyp. Issue 2:25. *f. 261.* 1909, and Issue 3:33, *f. 358.* 1910; and Synop. Apus Polyporus, p. 313, *f. 652.* 1915; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:182, *pl. 13, f. 45, a–d.* 1914; Peck, Rept. N.Y.S. Mus. 27:98. *pl. 2, f. 3–6.* 1875 and in Bull. Torrey Bot. Club 7:104. *f. 1–3.* 1880; Schmitz, Phytopathology 12:495, *f. 1.* 1922; Shope, Ann. Missouri Bot. Gard. 18:410. *pl. 16, f. 1.* 1931; von Schrenk, U. S. Dept. Agr. Div. Veg. Physiol. and Path. Bull. 25: *pl. 1, f. 2.* 1900; Zeller, Mycologia 7:125, *pl. 159, f. 1–2.* 1915.

Type of rot: bark and wood rot of conifers, see Schmitz, Jour. Gen. Physiol. 3:795–800. 1921, Jour. Forestry 21:502–503. 1923, and Phytopathology 12:494–496. 1922; and also Zeller as above.

*Series 2. Pore surface never surrounded by a volva, entirely free from the first.*

*I. Tubes usually of a markedly different color or consistency than the context.*

*A. Tubes usually more or less smoke colored to almost black, at least when dry.*

### 54. Polyporus crispus (Pers.) Fries

*Bjerkandera adusta* (Willd.) Karst. of No. Amer. Flora 9:40. 1907 in part.

*Pileus appressed-fibrillose, thin; margin crisped or wavy; trama brown in thin section; pores variable, 3–6 per mm.*

**Pileus** sessile or effused-reflexed, coriaceous, densely imbricate, 2–7 x 1–5 x 0.2–0.4 cm.; surface grayish to light brown, often cinnamon or light yellowish brown when dry, radially appressed-fibrillose toward the margin, usually strigose at the base, zonate to azonate; margin very thin, crisped or wavy, often becoming black

when dry, sterile below; **context** white or pallid, corky, usually separated from the tubes by a narrow dark line, 1–3 mm. thick, the hyphae rarely branched, thin- to medium thick-walled, 4–5 $\mu$ in diameter; **tubes** grayish black to black, 1–3 mm. long, mouths concolorous, subcircular to angular, variable in size, averaging 3–6 per mm., the edges medium to rather thick, entire; tramal tissue brown in thin section under the microscope; cystidia none; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, 3.5–4.5 x 1.5–2.5 $\mu$.

On the wood of deciduous trees, recorded on elm and maple. Apparently rare, or perhaps has been confused with *P. adustus* from which it differs only in the character of the upper surface and in the crisped or wavy margin of the pileus. Summer.

SM; LM; CF; MU.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 329, *f. 672.* 1915; Overholts, Ann. Missouri Bot. Gard. 2:726. *pl. 23, f. 7.* 1915; Shope, Ann. Missouri Bot. Gard. 18:424. *pl. 23, f. 1.* 1931.

**55. Polyporus adustus** (Willd.) Fries

*P. carpineus* (Sow.) Fries; *Bjerkandera adusta* (Willd.) Karst. of No. Amer. Flora 9:40. 1907 in part.

*Pileus tomentose, thin; trama brown in thin section; pores 6–8 per mm.*

**Pileus** sessile or effused-reflexed, somewhat fleshy to corky, sometimes imbricate, 1–5 x 3–8 x 0.2–0.6 cm.; surface white to tan or grayish, finely tomentose to short villous-tomentose, indistinctly zonate to azonate; margin thin, sterile below, often blackish in dried plants; **context** white to pallid, corky, in thick specimens separated from the tubes by a black line, 1–4 mm. thick, the hyphae rarely branched, thick-walled, 4–6 $\mu$ in diameter; **tubes** grayish black to black, 1–2 mm. long, mouths concolorous, circular to angular, averaging 6–8 per mm., the edges thin, entire; tramal tissue brown in thin section under the microscope; cystidia none; basidia "4–5 $\mu$ broad" (Shope); **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, rarely slightly curved, 3.5–5 x 1.5–2.5 $\mu$.

On the wood of deciduous or rarely of coniferous trees, recorded on ash, large-toothed aspen, trembling aspen, basswood, American beech, blue beech, elm, grapevine, sugar maple, black oak, balsam poplar, raspberry crown, sycamore, willow, and Norway spruce. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Murrill, Mycologia 10:107. *pl. 6, f. 1.* 1918; Overholts, Ann. Missouri Bot. Gard. 2:726. *pl. 23, f. 8.* 1915; Shope, Ann. Missouri Bot. Gard. 18:420. *pl. 21, f. 1–4.* 1931.

Type of rot: white mottled or cubical rot, see Hubert (**2,** p. 366).

**56. Polyporus fumosus** (Pers.) Fries

*P. fragrans* Peck; *Bjerkandera fragrans* (Peck) Murr.; *B. fumosa* (Pers.) Karst.; *B. puberula* (Berk. and Curt.) Murr.

*Pileus tomentose to glabrous, thick, often odorous; trama hyaline in thin section; pores 3–4 per mm., often pallid.*

**Pileus** sessile or effused-reflexed, usually licorice- or anise-scented when fresh, or with a disagreeable odor, leathery to rigid, dimidiate, often imbricate, conchate to subunguliform, 2–10 x 3–15 x 0.5–2 cm., or thicker; surface white to ochraceous or smoky white, rarely darker, finely tomentose to glabrous, azonate to subzonate; margin thick and obtuse to thin and acute, sterile below; **context** white to pallid, corky, zonate, sometimes with dark lines running through it and always separated from the tubes by a narrow dark line, 2–15 mm. thick, the hyphae rarely branched, somewhat thick-walled, 4–6 $\mu$ in diameter; **tubes** concolorous with the context or darkening to more or less smoke colored on drying, 1.5–4 mm. long, mouths white to grayish black, usually darkening on drying, sometimes becoming black where bruised, angular and somewhat unequal when mature, averaging 3–4 per mm., the edges moderately thick to thin, entire to dentate, sometimes incised; tramal tissue hyaline or nearly so in thin section under the microscope; cystidia none; basidia 5.5–7.5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, 4.5–6 x 2–3 $\mu$.

On the wood of deciduous trees, especially elm, recorded on blue beech, elm, and oak. Rather common. Summer and fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 308, *f. 647*, and p. 309, *f. 648* (as *P. Holmiensis*). 1915; Overholts, Ann. Missouri Bot. Gard. 2:726. *pl. 23, f. 3.* 1915.

*B. Tubes whitish to reddish or orange or purplish, more or less waxy when fresh. P. rhipidium laterally stipitate! (Tubes not waxy, compare 29. P. sulphureus; 60. P. abietinus; and 61. P. pargamenus).*

**57. Polyporus amorphus** Fries

*Tyromyces amorphus* (Fries) Murr.

*Tubes pinkish to orange or brick red; on coniferous substrata.*

**Pileus** sessile or effused-reflexed, sometimes resupinate, coriaceous, 0–2 x 1–4 x 0.2–0.3 cm.; surface white to grayish, villous-pubescent or tomentose, zonate; margin thin, sterile below; **context** white, spongy to firm when dry, 1–2 mm. thick, the hyphae rarely to occasionally branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** pinkish to orange or brick-red, somewhat waxy when fresh, appearing resinous when dry, 1–2.5 mm. long, mouths concolorous, angular, very irregular, averaging 2–4 per mm., the edges whitened,

thin, entire; hymenophore scarcely if at all distinct from the context; cystidia none; basidia 3–4 $\mu$ in diameter; **spores** hyaline, smooth, allantoid, 3.5–5 x 1–2 $\mu$.

On the wood and bark of coniferous trees, or growing over chips and needles of conifers, usually of pine. Very rare, once collected by F. H. Ames.

LM.

Illustrations: Murrill, Mycologia 10:107. *pl. 6, f. 5.* 1918; Overholts, Mycologia 9:270. *pl. 12.* 1917.

Type of rot: stringy rot of the sapwood of pitch pine, see Overholts, Mycologia 9:261–270. 1917.

### 58. **Polyporus dichrous** Fries

*Gloeoporus conchoides* Mont. of most early American determinations; *G. dichrous* (Fries) Bres.

*Tubes flesh-colored to dark purple, separable; usually on hardwoods.*

**Pileus** sessile or effused-reflexed, coriaceous, dimidiate, 0.5–3 x 1–6 x 0.1–0.5 cm.; surface white or whitish, velvety to glabrous, azonate; margin thin, acute to obtuse, sterile below; **context** white, soft-fibrous, 1–4 mm. thick, the hyphae somewhat branched, thick-walled, 3.5–4.5 $\mu$ in diameter; **tubes** flesh colored to reddish purple or purplish black, less than 1 mm. long, waxy and easily separable from the context in a thin elastic layer when fresh or when moistened, mouths concolorous, circular, averaging 5–7 per mm., the edges thin, entire; hymenophore sharply distinct from the context, the hyphae more or less gelatinized, 1–2 $\mu$ in diameter; cystidia none; basidia 3–4 $\mu$ in diameter; **spores** hyaline, smooth, allantoid, 3.5–4.5 x 0.5–1 $\mu$.

On the wood of deciduous or rarely of coniferous trees, recorded on speckled alder, alder unclassified, beech, hickory, sugar maple, maple unclassified, white oak, oak unclassified, willow, red cedar, hemlock, and red spruce. Common. Summer and fall. The species is characterized by the waxy tubes which are easily separable from the context when fresh. On this account it is often placed in a separate genus, Gloeoporus.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Lloyd, Mycol. Notes 65: *pl. 176, f. 1920.* 1920; Moffatt, Bull. Nat. Hist. Surv. Chicago Acad. Sci. 7, I: *pl. 16, f. 1.* 1909; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:158. *pl. 1, f. 5.* 1914 (as *Gloeoporus conchoides*).

### 59. **Polyporus rhipidium** Berk.

*Favolus rhipidium* (Berk.) Sacc.

*Laterally stipitate; tubes whitish to reddish; on hardwoods.*

**Stem** lateral, equal or enlarging at the base, whitish to reddish pulverulent, 0.5–2 cm. long, 0.1–0.4 cm. thick; **pileus** subfleshy to coriaceous when fresh, rigid when dry, reniform or spathulate, 1–2

cm. broad, 0.1–0.3 cm. thick; surface when young white, minutely squamulose or mealy, azonate, changing to light tan or brick-red on drying; margin thin and acute, fertile below; **context** white, not more than 1 mm. thick, the hyphae occasionally to much branched, thin-walled, rarely thick-walled, irregular, 5–8 $\mu$ in diameter; **tubes** whitish when fresh, turning to reddish on drying, 1–2 mm. long, more or less waxy when fresh, rigid when dry, the mouths white to reddish, angular, radially elongated, averaging 2–3 per mm., the edges moderately thick to somewhat thin, entire; hymenophore not distinct from the context; cystidia none or represented by hyaline, pointed or sometimes apically enlarged hairs 2–3 $\mu$ in diameter, sometimes in small groups, projecting up to 20 $\mu$; basidia 3.5–4 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 3.5–5 x 2–2.5 $\mu$.

On wood. Very rare, recorded but once, Sterling, C. H. Peck. SM.

Illustrations: Lloyd, Polyp. Issue 2:23. *f. 260, a–e.* 1909, and in Issue 3:33. *f. 357.* 1910; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:158. *pl. 1, f. 7.* 1914 (as Favolus).

*II. Tubes more or less of the same color and consistency as the context, at least when fresh.*

*A. Fruiting body more or less coriaceous when fresh, the context rarely over 5 mm. thick and usually much thinner; spores cylindrical to ellipsoid, or allantoid.*

*1. Dissepiments usually soon splitting, becoming tooth-like (compare also 71. P. undosus).*

### 60. **Polyporus abietinus** (Dicks.) Fries

*P. abietinus* var. *irpiciformis* Peck; *Polystictus abietinus* (Dicks.) Sacc. and Cub.; *Coriolus abietinus* (Dicks.) Quél.

*Cystidia often capitate-incrusted; pileus usually narrowly reflexed; pore surface often violaceous; on coniferous wood.*

**Pileus** sessile or effused-reflexed, sometimes resupinate, coriaceous, dimidiate, 0.5–5 x 1–5 x 0.1–0.3 cm.; surface whitish to grayish, sometimes greenish due to the presence of algae, becoming grayish black at the base, villous, zonate; margin thin, fertile below; **context** pallid to brownish, resinous appearing when dry, not more than 1 mm. thick, the hyphae rarely branched, thick-walled, 3–4 $\mu$ in diameter; **tubes** white, brownish, or violaceous, less than 3 mm. long, mouths concolorous, circular to angular, averaging 2–3 per mm. in poroid forms, usually the dissepiments soon splitting to form more or less evident teeth, or sometimes lamellate, the edges thin; **cystidia** abundant, or varying to absent, incrusted or not incrusted at the apex, 3–6 $\mu$ in diameter, projecting up to 10 $\mu$; basidia 5–6 $\mu$ in diameter; **spores** hyaline, smooth, cylindric-ellipsoid or allantoid, 5–7 x 2–2.5 $\mu$.

On the wood of coniferous trees, recorded on balsam, hemlock, larch, pitch pine, pine unclassified, black spruce, spruce unclassified, and oak (doubtful). Common. Spring, summer, and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Weir, Bull. Vocational Educat. (Idaho) 5, No. 5, p. 55, *f. 25.* 1922; Lloyd, Mycol. Notes 70: *pl. 259, f. 2567.* 1923; Overholts, Ann. Missouri Bot. Gard. 2:726. *pl. 23. f. 1–2.* 1915; Rhoads, N.Y.S. Coll. Forestry Tech. Publ. 11: *pl. 4.* 1918; Shope, Ann. Missouri Bot. Gard. 18:414. *pl. 18, f. 2–6.* 1931.

Type of rot: pitted sapwood rot of conifers, see Hubert (**2,** pp. 325–327.); Spaulding, U. S. Dept. Agr. Tech. Bull. 132. 1929.

### 61. **Polyporus pargamenus** Fries

*Polystictus* (*pergamenus*) *pargamenus* (Fries) Sacc.; *Coriolus prolificans* (Fries) Murr.

*Cystidia often capitate-incrusted; pileus usually sessile; pore surface often violaceous; usually on deciduous wood.*

**Pileus** sessile or effused-reflexed, often narrowed at the base, coriaceous, 1–6 x 1–6 x 0.1–0.5 cm.; surface whitish, yellowish, grayish, or brownish with age, or dark gray behind, villous or velvety tomentose, zonate; margin thin, sterile below; **context** white to brownish, less than 1 mm. thick, the hyphae thick-walled, somewhat branched, 2–6 $\mu$ in diameter; **tubes** white to brownish, or violaceous, 1–5 mm. long, mouths concolorous, the dissepiments usually soon breaking up to form teeth, or sometimes concentric lamellae, when poroid mouths averaging 3–4 per mm., the edges thin; **cystidia** abundant to rare, often incrusted at the tips, 4–5 $\mu$ in diameter, projecting up to 15 $\mu$; basidia "5–7 $\mu$ broad" (Shope); **spores** hyaline, smooth, cylindrical to allantoid, 5–6.5 x 1.5–2.5 $\mu$.

On the wood of deciduous or rarely of coniferous trees, recorded on large-toothed aspen, trembling aspen, basswood, beech, purple beech, yellow birch, white birch, black cherry, fire cherry, cherry unclassified, American chestnut, Spanish chestnut, pignut hickory, swamp hickory, hickory unclassified, striped maple, sugar maple, maple unclassified, red oak, white oak, oak unclassified, poplar, hemlock, and pine. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hard, Mushrooms, p. 415, *f. 345.* 1908 (as *Polystictus pergamenus*); Overholts, Ann. Missouri Bot. Gard. 2:726. *pl. 23, f. 9.* 1915; Rhoads in N.Y.S. Coll. Forestry Tech. Publ. 8: *pl. 6.* 1917 (as *Coriolus prolificans*), and in Tech. Publ. 11: *pl. 1–3, 5–6, 19, 30–31.* 1918; Shope, Ann. Missouri Bot. Gard. 18:410. *pl. 16, f. 1.* 1931; von Schrenk and Spaulding, U. S. Dept. Agr. Bur. Plant Indus. Bull. 149:57. *f. 7.* 1909 (as *Polystictus pergamenus*).

Type of rot: saprot of deciduous trees, see Rhoads, N.Y.S. Coll. Forestry Tech. Publ. 11. 1918 (biology); von Schrenk and Spaulding (**13,** pp. 56–58).

**62. Polyporus tulipiferus** (Schw.) Overh.

*Irpex tulipifera* (Schw.) Fries; *Irpiciporus lacteus* (Fries) Murr.; *I. Tulipiferae* (Schw.) Murr.

*Cystidia usually incrusted throughout; pore surface white; on hardwoods.*

**Pileus** sessile or effused-reflexed, or resupinate, thin and coriaceous, usually narrowly elongate and confluent, 0–1 x 1–5 x 0.2–0.6 cm.; surface white or whitish, villous, zonate; margin thin, fertile below; **context** white, fibrous, 0.5–2 mm. thick, the hyphae rarely branched, thick- to thin-walled, 4–6 $\mu$ in diameter; **tubes** white or whitish, 1–5 mm. long, mouths white to yellowish, usually the dissepiments very soon breaking up to form compressed teeth which remain connected at their bases, often concentrically arranged, when poroid the mouths angular, averaging about 2 per mm., edges thin to moderately thick, soon becoming dentate to incised; **cystidia** scattered, usually incrusted throughout, 4–5.5 $\mu$ in diameter, projecting up to 25 $\mu$; basidia 5 $\mu$ in diameter; **spores** "cylindric, smooth, hyaline, 5–6 x 1–2 $\mu$" (Overholts).

On the wood of deciduous trees, recorded on speckled alder, beech, and tulip poplar. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Baxter, Papers Michigan Acad. Sci., Arts, Lett. 14: 290. *pl. 36.* (1930) 1931 (as Irpex); Overholts, Wash. Univ. Studies 3: 88. *pl. 3, f. 11, a–c.* 1915.

**63. Polyporus biformis** Klotzsch

*Coriolus biformis* (Klotzsch) Pat.; *C. molliusculis* (Berk.) Murr.

*Cystidia none; pileus appressed fibrillose; pores 1–2 per mm.*

**Pileus** sessile or more often effused-reflexed, coriaceous when fresh, rather rigid when dry, often laterally confluent and imbricate, 1–5 x 2–6 x 0.2–1.2 cm.; surface white to light tan, usually rough with radially appressed fibrils, azonate to subzonate; margin thin, fertile below; **context** white, fibrous-tough when fresh, corky when dry, 1–5 mm. thick, the hyphae rarely branched, thick-walled, 3–4 $\mu$ in diameter; **tubes** concolorous with the context or slightly darker, 2–7 mm. long, mouths white to yellowish or light brown, the dissepiments usually soon breaking up to form teeth, when poroid mouths circular to angular or daedaloid, averaging 1–2 per mm., the edges thin; cystidia none; basidia not observed; **spores** hyaline, smooth, sometimes with a small apiculus, cylindrical to slightly curved, 6–8 x 2–2.5 $\mu$.

On the wood of deciduous trees, recorded on black ash, ash unclassified, basswood, beech, and birch. Frequent. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hard, Mushrooms, p. 412, *f. 341.* 1908; Lloyd, Mycol. Notes 42:580. *f. 817.* 1916 (as Polystictus); Overholts, Wash. Univ. Studies 3:88. *pl. 3, f. 16, a–b.* 1915.

*2. Dissepiments not splitting, the edges of the mouths entire to lacerate.*

*a. Surface of the pileus hirsute to tomentose or velvety.*

**64. Polyporus hirsutulus** Schw.

*Coriolus hirsutulus* (Schw.) Murr.

*Pileus hirsute or strigose, indistinctly zonate, thin.*

**Pileus** sessile or effused-reflexed, often imbricate, coriaceous, dimidiate, 0.5–2 x 1–3 x 0.1–0.2 cm.; surface grayish to yellowish brown, hirsute or strigose, somewhat indistinctly zonate; margin thin, acute, usually sterile below; **context** white, fibrous, less than 1 mm. thick, the hyphae rarely branched, thick-walled, sometimes somewhat incrusted, 5–8 $\mu$ in diameter; **tubes** white, less than 2 mm. long, mouths whitish to yellowish, circular to angular, averaging 3–5 per mm., the edges thin, entire; cystidia none; hyphal pegs rare, 15–30 $\mu$ in diameter, projecting up to 35 $\mu$; basidia 3.5–4.5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 4–5.5 x 1.5–2 $\mu$.

On branches of hardwoods, recorded on black oak and on sumach. Summer and fall. Probably frequent. No doubt it has often been placed under *P. versicolor*, from which it differs by the more strigose and less markedly zonate surface.

NYBG; CU; LM; CF; MU.

Illustrations: Overholts, Wash. Univ. Studies 3:88. *pl. 3, f. 12, a–d.* 1915.

**65. Polyporus versicolor** (L.) Fries

*P. versicolor* var. *carneiporus* Peck; *Polystictus versicolor* (L.) Sacc.; *Coriolus versicolor* (L.) Quél.

*Pileus villous or velvety, distinctly multizonate, thin.*

**Pileus** sessile or effused-reflexed, coriaceous, usually imbricate, dimidiate, frequently narrowed at the base, 1–5 x 1–6 x 0.1–0.3 cm.; surface very variable in color, white varying through almost all shades of color to brownish or blackish, distinctly zonate with many narrow multicolored zones, villous or velvety; margin thin, sterile or fertile below; **context** white, fibrous, 1 mm. or less thick, the hyphae rarely branched, thick-walled, 5–10 $\mu$ in diameter; **tubes** white or whitish, 1–2 mm. long, mouths white, yellowish, or brownish, circular to angular, averaging 3–5 per mm., the edges thin, entire to slightly lacerate; cystidia none; hyphal pegs 15–50 $\mu$ in diameter, projecting up to 40 $\mu$; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, straight to slightly curved, 5–7 x 1.5–2.5 $\mu$.

On the wood of deciduous and sometimes of coniferous trees, recorded on basswood, beech, gray birch, yellow birch, birch

unclassified, wild cherry, American elm, elm unclassified, grape, mockernut hickory, hickory unclassified, hornbeam, soft maple, maple unclassified, red oak, oak unclassified, pear, Prunus sp., balsam, hemlock, juniper, white pine, pine unclassified, Norway spruce, and red spruce. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hard, Mushrooms, p. 413, *f. 343.* 1908; Hesler, Jour. Tennessee Acad. Sci. 4:6. *f. 3.* 1929; Marshall, Mushroom Book, p. 112. 1905; Moffatt, Bull. Nat. Hist. Surv. Chicago Acad. Sci. 7, I: *pl. 17, f. 1.* 1909 (as Polystictus); Shope, Ann. Missouri Bot. Gard. 18:410. *pl. 16, f. 2.* 1931; Stevens, Phytopathology 2:118. *pl. 10.* 1912; White, Connecticut Geol. and Nat. Hist. Surv. Bull. 3:64. *pl. 36.* 1905 (as Polystictus).

Type of rot: white spongy rot of deciduous trees, see Bayliss, Jour. Econ. Biol. 3:1–24. 1908 (biology); Stevens, Mycologia 4:263–270. 1912, and in Phytopathology 2:114–119. 1912; von Schrenk and Spaulding (**13,** pp. 47, 48, 53–56).

### 66. **Polyporus zonatus** Fries

*P. zonatus* var. *imperfectus* Peck; *Polystictus zonatus* (Fries) Sacc.; *Coriolus zonatus* (Fries) Quél.

*Pileus velvety to villous, zonate, more or less orange, 2–4 mm. thick.*

**Pileus** sessile or effused-reflexed, coriaceous, dimidiate, often narrowed at the base, 1–3 x 1–5 x 0.2–0.4 cm.; surface gray with concentric zones of buff or orange, or more or less concolorous with zones of different shades, minutely velvety to short villous; margin thin, sterile below; **context** white, corky, 1–3 mm. thick, the hyphae occasionally branched, thick-walled, 4–12 $\mu$ in diameter; **tubes** white to ochraceous, 1–2.5 mm. long, mouths concolorous, angular, averaging 3–4 per mm., the edges thin, becoming dentate with age; cystidia none; hyphal pegs 12–18 $\mu$ in diameter, projecting up to 40 $\mu$; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 6–8 x 2–3 $\mu$.

On the wood of deciduous trees, recorded on large-toothed aspen, trembling aspen, white birch, poplar, and on coniferous wood unclassified (doubtful). Uncommon. Summer and fall. Very closely related to *P. versicolor,* differing only in the thicker context.

NYBG; SM; CU; LM; CF; MU.

### 67. **Polyporus hirsutus** (Wulf.) Fries

*Polystictus hirsutus* (Wulf.) Sacc.; *Coriolus nigromarginatus* (Schw.) Murr.

*Pileus hirsute to tomentose, grayish to yellowish or brownish, 2–10 mm. thick.*

**Pileus** sessile or effused-reflexed, coriaceous to rigid, imbricate or solitary, 1–7 x 2–10 x 0.2–1 cm.; surface grayish to yellowish or

brownish, hirsute or tomentose, usually concentrically sulcate and zonate; margin sometimes dark colored, thin to thick, sterile below; **context** white to pallid, tough to soft-corky, 1–6 mm. thick, the hyphae rarely branched, thick-walled, 4–7 $\mu$ in diameter; **tubes** white, yellowish, or pale smoky, 1–4 mm. long, mouths concolorous, circular, averaging 3–4 per mm., the edges usually thick and entire; cystidia none; hyphal pegs occasionally present, hyaline, usually incrusted, 15–40 $\mu$ in diameter, projecting up to 50 $\mu$; basidia "5–6 $\mu$ broad" (Shope); **spores** hyaline, smooth, cylindrical to allantoid, 5–8 x 2–3 $\mu$.

On the wood of deciduous and rarely of coniferous trees, recorded on trembling aspen, alder, basswood, American beech, purple beech, birch, butternut, fire cherry, elm, hickory, locust, black oak, oak unclassified, peach, tulip poplar, hemlock, and white spruce. Common. Summer and fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Hard, Mushrooms, p. 412, *f. 342.* 1908; Overholts, Wash. Univ. Studies 3:88. *pl. 3, f. 14, a–b.* 1915; Owens, Prin. Plant Path., p. 439, *f. 152.* 1928 (as Polystictus); Shope, Ann. Missouri Bot. Gard. 18:412. *pl. 17, f. 3.* 1931.

Type of rot: white spongy sapwood rot of deciduous trees, see Hubert (**2,** p. 369).

### 68. **Polyporus pubescens** (Schum.) Fries

*P. Grayii* Cooke; *P. velutinus* (Pers.) Fries; *Coriolus pubescens* (Schum.) Murr.

*Pileus villous-tomentose to glabrous, usually yellowish, 2–10 mm. thick.*

**Pileus** sessile, coriaceous to fleshy-tough when fresh, rather rigid when dry, dimidiate, 1–5 x 2–5 x 0.2–1 cm.; surface white to yellowish or ochraceous, "rarely umber" (Overholts), short villose-tomentose to finely tomentose, varying to almost glabrous, inconspicuously zonate to azonate; margin thin, sterile or fertile below; **context** white, fibrous-tough when fresh, firmer when dry, 1–5 mm. thick, the hyphae occasionally branched, thick-walled, 4–8 $\mu$ in diameter; **tubes** concolorous, 1–4 mm. long, mouths white, yellowish, or "umber" (Overholts), angular, averaging 3–4 per mm., the edges thin and often dentate; cystidia none; hyphal pegs 12–20 $\mu$ in diameter, projecting up to 30 $\mu$; basidia not observed; **spores** hyaline, smooth, cylindrical, straight to slightly curved, 5–6 x 1.5–2 $\mu$.

On the wood of deciduous trees, recorded on smooth alder, speckled alder, apple, beech, maleberry, yellow birch, birch unclassified, wild cherry, poplar, and willow. Common. Summer and fall. *P. velutinus* is the thin form.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hard, Mushrooms, p. 410, *f. 339.* 1908; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:164. *pl. 4, f. 21* (as *P. velutinus*) and p. 178, *pl. 11, f. 36, a–c.* 1914; Overholts, Wash. Univ. Studies 3:88. *pl. 3, f. 15, a–b.* 1915.

*b. Surface of the pileus finely tomentose to glabrous (compare also 68. P. pubescens; 72. P. semisupinus; 73. P. floriformis; 85. P. semipileatus; and 93. P. anceps).*

**69. Polyporus conchifer** (Schw.) Fries

*P. virgineus* (Schw.) Fries; *Polystictus conchifer* (Schw.) Sacc.; *Poronidulus conchifer* (Schw.) Murr.

*Pileus white, usually bearing a sterile cup-shaped structure at the base.*

**Pileus** substipitate to sessile, the stem when present represented by a small lateral tubercle, or rarely the pileus centrally attached and somewhat umbilicate, usually bearing a small cup-shaped sterile structure at the base on the upper side, coriaceous, reniform to dimidiate, or, when centrally attached, more or less circular, 1–4 x 1–4 x 0.2–0.4 cm.; surface white to yellowish, rarely marked with brownish concentric zones, glabrous, zonate to azonate; margin very thin, sterile or fertile below; **context** white, fibrous, 1 mm. or less thick, the hyphae rarely to often branched, thick- to thin-walled, 2–6 $\mu$ in diameter, the larger usually rarely branched; **tubes** white, not more than 2 mm. long, mouths white to yellowish, angular, averaging 3–4 per mm., the edges thin, usually dentate to lacerate or incised; cystidia none; hyphal pegs 20–80 $\mu$ in diameter, projecting 20–70 $\mu$; basidia not observed; **spores** hyaline, smooth, cylindrical to slightly curved, 6–7.5 x 1.5–2 $\mu$.

On branches of elm, also once recorded on chestnut. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Icones Farlowianae, p. 101, *pl. 94.* 1929 (as Polystictus); Lloyd, Polyp. Issue 3:41. *f. 365–366.* 1910 (as Polystictus); Moffatt, Bull. Nat. Hist. Surv. Chicago Acad. Sci. 7, I: *pl. 16, f. 2.* 1909 (as Polystictus); Murrill, Mycologia 10:107. *pl. 6, f. 2.* 1918; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:164. *pl. 4, f. 20, a–c.* 1914 (as Polystictus); Overholts, Wash. Univ. Studies 3:88. *pl. 3, f. 10, a–e.* 1915.

**70. Polyporus planellus** (Murr.) Overh.

*P. planus* Peck; *Coriolus planellus* Murr.

*Pileus brown, zonate; pores 5–6 per mm.; spores 9–12 x 3.5–4.5 $\mu$.*

**Pileus** sessile or effused-reflexed, sometimes resupinate, or rarely narrowed at the base and appearing substipitate, coriaceous, 1–4 x 1–4 x 0.1–0.2 cm.; surface light brown to dark brown, zonate

with darker zones, velvety to glabrous; margin thin, light-colored, velvety, sterile below; **context** pallid to light brown, 1 mm. or less thick, the hyphae somewhat branched, thick-walled, 2.5–4 $\mu$ in diameter; **tubes** pallid to brownish, 1 mm. or less long, mouths whitish to brownish, often white-incrusted, angular to daedaloid, or often more or less hexagonal, averaging 5–6 per mm., the edges moderately thick, entire; cystidia none; basidia 6–8 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical to ellipsoid, 9–12 x 3.5–4.5 $\mu$.

On the wood of deciduous trees, recorded on hickory, hornbeam, and poplar. Rare. Summer and fall. This species belongs much more properly under the genus Trametes, in the section with pale brown context, close to *Trametes mollis*, but the writer does not wish to make a new combination in a genus of such doubtful worth as the genus Trametes.

*Trametes Kmetii* Bres. is very close if not identical to *P. planellus.*

NYBG; SM; LM; MU.

Illustrations: Shope, Ann. Missouri Bot. Gard. 18: 422. *pl. 22, f. 1.* 1931.

*B. Fruiting body subcoriaceous to fleshy tough when fresh; context 0.5–3 mm. thick.*

*1. Spores allantoid.*

### 71. **Polyporus undosus** Peck

*Tyromyces undosus* (Peck) Murr.

*Margin undulate; pores 1–2 per mm., the edges usually incised.*

**Pileus** effused-reflexed or resupinate, subcoriaceous to fibrous-fleshy when fresh, rigid when dry, often laterally confluent, 0–0.7 x 2–9 x 0.2–0.3 cm.; surface whitish or yellowish to brownish, slightly spongy-tomentose, obscurely sulcate zoned; margin very thin, undulate, fertile below; **context** white, fleshy-fibrous to fragile, not over 1 mm. thick, the hyphae rarely to frequently branched, often irregular, thick-walled, 5–8 $\mu$ in diameter; **tubes** white, 1–3 mm. long, mouths concolorous, irregular, angular, 1–2 per mm., the edges thin, dentate to incised; cystidia none; basidia 4.5–5 $\mu$ in diameter; **spores** hyaline, smooth, allantoid, 4–5 x 1.5–2 $\mu$.

On the wood of coniferous or more rarely of deciduous trees, recorded on hemlock and beech. Rare. Summer and fall.

NYBG; SM; CU; MU.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 317, *f. 657.* 1915; Lowe, Papers Michigan Acad. Sci., Arts, Lett. 19. *pl. 14, f. 4–5.* 1934.

*2. Spores ellipsoid to ovoid (compare also 77a. P. spumeus var. malicola).*

**72. Polyporus semisupinus** Berk. and Curt.

*Tyromyces semisupinus* (Berk. and Curt.) Murr.

*Pileus usually yellowish, with resinous streaks; on hardwoods.*

**Pileus** sessile or narrowed at the base and appearing substipitate, sometimes excentrically attached, often in the form of a rosette, fleshy-tough when fresh, rigid and brittle when dry, imbricate, 1–2.5 x 0.5–1.5 x 0.05–0.15 cm.; surface whitish to yellowish, usually with radial streaks which appear more or less resinous or cartilaginous when dry, glabrous, faintly zonate, sometimes with short, sterile proliferations; margin thin, acute, often resinous when dry, fertile below; **context** white to pallid, firm when dry, 1 mm. or less thick, the hyphae rarely branched, usually thick-walled, sometimes thin-walled, 2.5–4.5 $\mu$ in diameter; **tubes** whitish to yellowish or yellowish brown, not over 1 mm. long in specimens seen ("2–3 mm. long," Murrill), mouths concolorous, angular, averaging 4–8 per mm., the edges thin, entire; cystidia none; basidia 4–4.5 $\mu$ in diameter; **spores** hyaline, smooth, ellipsoid to ovoid, 2.5–4 x 2–3 $\mu$.

On the wood of deciduous trees, recorded only on yellow birch. Rare. Summer and fall.

NYBG; SM; LM; MU.

Illustrations: Lowe, Papers Michigan Acad. Sci., Arts, Lett. 19. *pl. 15, f. 2.* 1934.

**73. Polyporus floriformis** Quél.

*Pileus more or less white; cystidia none; usually on conifers.*

**Pileus** usually narrowed to a stem-like base, sometimes in the form of a rosette and with a central stem-like point of attachment, imbricate, subcoriaceous, becoming rather rigid when dry, 1–4 x 1–5 x 0.1–0.4 cm.; surface white when fresh, discoloring to grayish or slightly brownish when dry, azonate or nearly so, nearly glabrous; margin thin, usually narrowly sterile below; **context** white, azonate, subcorky when fresh, very hard when dry, taste slightly acid, 1–2 mm. thick, the hyphae rarely branched, usually thick-walled, 4–5 $\mu$ in diameter; **tubes** white when fresh, discoloring on drying, 1–3 mm. long, mouths whitish to yellowish, circular to angular, averaging 4–6 per mm., the edges at first thick and entire, becoming thin and slightly lacerate; cystidia none; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, broadly ellipsoid to ovoid, sometimes very slightly curved, 3.5–5 x 2–2.5 $\mu$.

On the wood of coniferous and perhaps of deciduous trees. It is said to grow at the base of larch trees in Europe; the writer has collected it from that habitat in Michigan. The species is close to *P. semisupinus*, but differs in the absence of any cartilaginous streaks on the surface of the pileus, by the thicker context, and perhaps by the kind of substratum.

LM.

Illustrations: Lowe, Papers Michigan Acad. Sci., Arts, Lett. 19. *pl. 15, f. 1.* 1934.

**74. Polyporus balsameus** Peck

*P. crispellus* Peck; *Coriolus balsameus* (Peck) Murr.; *Tyromyces balsameus* (Peck) Murr.; *T. crispellus* (Peck) Murr.

*Pileus usually pale brownish, zonate; cystidia present; on conifers.*

**Pileus** sessile or narrowed behind and appearing substipitate, subcoriaceous to fleshy-tough when fresh, rather rigid when dry, 1–3 x 2–5 x 0.2–0.5 cm.; surface whitish to pale brownish, subglabrous to slightly and unequally appressed villose-tomentose, marked by rather faint concentric zones, sometimes, at least, becoming reddish where bruised; margin thin, narrowly sterile below; **context** white, fibrous, slightly zonate, 1–3 mm. thick, the hyphae rarely branched, moderately thick- to thin-walled, 5–9 $\mu$ in diameter; **tubes** white to discolored within, 1.5–3.5 mm. long, mouths concolorous, subcircular to angular, 3–6 per mm., edges thin and finely dentate, or rather thick and entire; **cystidia** thin-walled, not incrusted, 4–9 $\mu$ in diameter, projecting up to 20 $\mu$; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, often one-guttulate, ellipsoid to ovoid, 3–5 x 2–3 $\mu$.

On the wood of coniferous trees, recorded on balsam, hemlock, and spruce. Rare. Summer and fall.

NYBG; SM; LM; CF; MU.

Illustrations: Hubert, Phytopathology 19: 729. *f. 3.* 1929, and in Outl. For. Path., p. 345, *f. 89.* 1931; McCallum, Bull. Canada Dept. Agr. N.S. 104: *pl. 7, f. 2–3.* 1928.

Type of rot: butt rot of balsam, see Hubert in Phytopathology 19: 725–732. 1929, and in (**2,** pp. 340–347); and McCallum, Bull. Canada Dept. Agr. N.S. 104. 1928.

The specimens in the type collection of *P. crispellus* are thicker and more fleshy than those of the type collection of *P. balsameus,* though some specimens in the two collections approach each other in this character. The upper surface of the specimens of *P. balsameus* is distinctly subpubescent, with a radial arrangement of the fibrils, and the zonation is very faint. The surface of the specimens of *P. crispellus,* on the other hand, is practically glabrous, considerably wrinkled on drying, and the zones are somewhat more conspicuous. Both agree in their microscopic characters. It seems best to consider the two species synonymous, as Murrill (*Jour. N. Y. Bot. Gard.* 13:177–178. 1912) has also referred them.

*Polyporus floriformis* Quél. and *P. tephroleucus* Fries are regarded as synonyms of *P. balsameus* by Hubert (*Phytopathology* 19:725. 1929). *P. floriformis* is white when fresh and lacks cystidia. *P. tephroleucus* is reported with spores of quite a different shape.

*C. Fruiting body soft and watery when fresh, the context usually 2–5 mm. or more thick, or, if fleshy-tough to corky or subcoriaceous, the context usually thick.*

*1. Spores ellipsoid to subglobose.*

*a. Pores small, 2–6 per mm.*

*(1) Spores 2.5–4.5 $\mu$ long.*

**75. Polyporus fumidiceps** Atk.

*Tyromyces fumidiceps* Atk.

*Pileus grayish to grayish brown; tubes often turning greenish where bruised.*

**Pileus** sessile or effused-reflexed, soft and watery when fresh, imbricate, often laterally confluent, with a strong or faint fragrant odor when fresh, 1–4 x 2–5 x 0.5–1 cm.; surface grayish to grayish brown, minutely pubescent to glabrous, sometimes with short bundles or fascicles of hyphae giving a somewhat tubercular appearance, azonate; margin abruptly thin, sterile below; **context** white or slightly grayish on drying, soft and watery when fresh, rather hard and fragile when dry, azonate, 2–5 mm. thick, the hyphae somewhat branched, thick-walled, 3–4.5 $\mu$ in diameter; **tubes** white, often turning a light green within on cutting or on drying, the color usually soon fading, 3–6 mm. long, mouths white to pallid, or with a greenish tint which is somewhat more persistent than the color in the tubes, circular to angular, averaging 4–5 per mm., the edges moderately thick, entire; cystidia not observed; basidia 3 $\mu$ in diameter; **spores** hyaline, smooth, one-guttulate, ellipsoid to subglobose, 2.5–4 x 2–3 $\mu$.

On the wood of deciduous trees, recorded only on willow. Rare. Summer and fall.

CU; LM.

Illustrations: Overholts, Ann. Missouri Bot. Gard. 2:726. *pl. 23, f. 6.* 1915.

**76. Polyporus galactinus** Berk.

*Pileus white to yellowish brown; context strongly zonate when dry.*

**Pileus** sessile, soft and watery when fresh, imbricate or solitary, dimidiate, with a fragrant odor when fresh, 3–8 x 5–10 x 1–3 cm.; surface white to gray and smooth when fresh, when dry yellowish to light yellowish brown and varying from matted tomentose to scrupose or to more or less strigose, especially at the base, azonate; margin abruptly thin, narrowly sterile below; **context** white to pallid, watery and spongy when fresh, when dry hard and strongly zonate, sometimes resinous appearing, 0.3–2 cm. thick, the hyphae rarely branched, thin-walled, 4–6 $\mu$ in diameter; **tubes** white to ochraceous or brownish, 5–10 mm. long, mouths more or less concolorous, angular, averaging 4–6 per mm., the edges thin, entire to fimbriate; cystidia none; basidia 4.5–5 $\mu$ in diameter; **spores** hyaline, smooth, one-guttulate, ellipsoid to subglobose, 3–4.5 x 2–3 $\mu$.

On very rotten wood of deciduous trees, especially apple, recorded on apple, black ash, ash unclassified, and willow. Frequent. Summer and fall. Very close to *P. spumeus* var. *malicola* but differing in growing on very rotten logs and in having somewhat smaller pores.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Dodge, Mycologia 8:14. *pl. 175.* 1916; Lloyd, Synop. Apus Polyporus, p. 306, *f. 643–646.* 1915; Overholts, Ann. Missouri Bot. Gard. 2:728. *pl. 24, f. 12, 15, 17.* 1915.

**Polyporus iowensis** Lloyd, *Mycol. Notes* 75:1363 and *pl. 344, f. 3257.* 1925, has been found in a neighboring state and it will probably be found in New York State. It differs from *P. galactinus* in the changes which take place upon drying. The pileus discolors but slightly; the surface becomes glabrous to slightly roughened; and the context becomes soft and friable, and is azonate. A more complete description is given by Miss Wolf (**14,** p. 63), and by Lowe, Papers Michigan Acad. Sci., Arts, Lett. 19:145. 1934.
Illustrations: Lloyd, as cited, and Lowe, in paper cited, *pl. 15, f. 5.*

*(2) Spores 4.5–7 μ or more long.*

### 77. Polyporus spumeus (Sow.) Fries

*Spongipellis occidentalis* Murr.

*Spores 5–7 x 4–5 μ; pileus drying hirsute to nearly glabrous.*

**Pileus** sessile, or rarely narrowed behind and appearing substipitate, subimbricate, soft and watery when fresh, rigid and brittle when dry, dimidiate, usually with an anise-like odor when fresh, 5–20 x 5–20 x 1–4 cm.; surface white when fresh, yellowish to brownish when dry, hirsute or more often on drying becoming matted-tomentose to nearly glabrous, azonate; margin thin to thick, fertile or sterile below; **context** white to slightly yellowish, soft when fresh, usually duplex when dry, firm-fibrous below, spongy above, or firm fibrous throughout, zonate, 0.5–3 cm. thick, the hyphae somewhat branched, rather thin-walled, 4–6 μ in diameter; **tubes** white to yellowish, 0.5–1.5 cm. long, often collapsing on drying, mouths concolorous, angular, 2–5 per mm., the edges thin and lacerate-dentate; cystidia none; basidia "5–7 μ in diameter" (Shope); **spores** hyaline, smooth, apiculate, one-guttulate, ellipsoid to subglobose, 5–7 x 4–5 μ.

On wounds of living trees, reported also on old logs, recorded on white ash, ash unclassified, basswood, beech, elm, and horse-chestnut. Rather rare. Fall.

NYBG; SM; CU; LM; MU.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 304, *f. 641–642.* 1915; Overholts, Ann. Missouri Bot. Gard. 2:728. *pl. 24, f. 10–11, 14a.* 1915; Shope, Ann. Missouri Bot. Gard. 18:434. *pl. 28, f. 2.* 1931.

### 77a. Polyporus spumeus var. malicola Lloyd

*Polyporus malicola* Lloyd

As in the typical form but the pileus thinner; context usually less than 2 mm. thick; spores hyaline, smooth, ovoid to subglobose, 4.5–5 x 3.5–4 μ.

On the wood of apple trees. Rather rare. Summer and fall.

According to Lloyd (**6,** p. 305) this species "is the basis of *Polyporus galactinus* of Murrill's work" (*Spongipellis galactinus*

[Berk.] Pat. in No. Amer. Flora 9 : 39. 1907). Murrill, however, gives the spore size as 3–4 x 1.5–2 $\mu$, which is approximately the spore size of *P. galactinus* as described in this manual. The writer has not measured the spores from any of Murrill's specimens of *S. galactinus*.

?NYBG; CU; LM; CF; MU.

**78. Polyporus Spraguei** Berk. and Curt.

*Tyromyces Spraguei* (Berk. and Curt.) Murr.

*Spores 4.5–5.5 x 4–5 $\mu$; pileus drying nearly glabrous, sordid white; context drying hard, zonate; usually malodorous.*

**Pileus** sessile or effused-reflexed, or sometimes strongly narrowed at the base, fleshy-tough and watery when fresh, rigid when dry, subimbricate or solitary, dimidiate or flabelliform, often with a very disagreeable odor when fresh, 4–10 x 5–15 x 0.5–3 cm.; surface white to grayish, appressed-tomentose to glabrous, azonate to somewhat zonate, usually roughened, sometimes somewhat tuberculate; margin often blackening in dried specimens, thin to rather thick, fertile below; **context** white or whitish, watery and fibrous-tough when fresh, usually very hard when dry, zonate, 0.3–2.5 cm. thick, the hyphae somewhat branched, thick-walled, sometimes thin-walled, 4–7 $\mu$ in diameter; **tubes** white to ochraceous, sometimes darkening on drying, 0.3–1 cm. long, mouths concolorous, angular, averaging 4–5 per mm., the edges thin, entire; cystidia none or represented by scarcely projecting, non-incrusted, hyaline, pointed bodies 4.5–5 $\mu$ in diameter; basidia not observed; **spores** hyaline, smooth, one-guttulate, apiculate, ovoid to subglobose, 4.5–5.5 x 4–5 $\mu$.

On the wood of deciduous trees, recorded on chestnut, oak, and larch (doubtful). Rather common. Summer and fall.

NYBG; SM; CU; LM; CF.

Type of rot: brown heartrot in oaks, chestnut, and persimmon, see Weir in Phytopathology 13 : 288. 1923, and in Phytopathology 17 : 339–340. 1927.

**79. Polyporus robiniophilus** (Murr.) Lloyd

*Trametes robiniophila* Murr.

*Spores 6–9 x 5.5–7 $\mu$; pileus drying brownish, nearly glabrous, corky.*

**Pileus** sessile, somewhat watery but firm when fresh, firm and corky when dry, rarely imbricate, turning brownish on drying, 3–10 x 4–15 x 1–7 cm.; surface white to cinereous or yellowish when fresh, usually brownish when dry, nearly glabrous, azonate to subzonate, concentrically sulcate in large specimens; margin at first thick and obtuse, becoming thin and acute when mature, sterile below; **context** white when fresh, when dry light brown, soft and

punky to corky, "often with a sweet odor" (Overholts), 0.5–6 cm. thick, the hyphae rarely to occasionally branched, thick-walled, of two diameters: some 6–9 $\mu$, others 1–3 $\mu$; **tubes** concolorous with the context, 0.3–1 cm. long, the mouths concolorous, sometimes darker, circular to angular, averaging 4–6 per mm., the edges thick, entire; cystidia none or represented by two types of structures: some cystidia-like with swollen bases and blunt apices, 4–8 $\mu$ in diameter, others hyphae-like, 1.5–2.5 $\mu$ in diameter, projecting up to 40 $\mu$; basidia 10 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, often one-guttulate, ovoid to subglobose, 6–9 x 5.5–7 $\mu$.

On the wood of locust (Robinia). Rare. Late summer and fall.

SM; CU; LM; CF; MU.

Illustrations: Hesler, Jour. Tennessee Acad. Sci. 4:4. *f. 1.* 1929; Lloyd, Synop. Apus Polyporus, p. 315, *f. 653.* 1915; Overholts, Wash. Univ. Studies 3:90. *pl. 4, f. 17, a–b.* 1915.

Type of rot: white heartrot of locust, see Kauffman and Kerber, Amer. Jour. Bot. 9:493–508. 1922.

*b. Pores usually 1–2 per mm. or larger.*

### 80. **Polyporus borealis** Fries

*Spongipellis borealis* (Fries) Pat.

*Pileus coarsely hispid to fibrillose; cystidia present; on conifers.*

**Pilei** substipitate, narrowed at the base, or more rarely sessile, flabelliform to dimidiate, watery-tough when fresh, drying decidedly fibrous-tough, 3–12 x 3–12 x 0.5–2.5 cm.; surface white, yellowish, or brownish, coarsely hispid to tomentose or fibrillose, spongy when fresh, azonate; margin thin, in dried specimens often assuming a distinctly resinous appearance, fertile below; **context** white, usually duplex when dry, firm and fibrous next the tubes, coarsely fibrous above, somewhat zonate in dried specimens, 0.5–2 cm. thick, the hyphae rarely branched, thin-walled, often collapsing, 4–8 $\mu$ in diameter; **tubes** white when fresh, yellowish or light yellowish brown on drying, often collapsed in dried specimens, 3–10 mm. long, mouths concolorous, angular to daedaloid, irregular, averaging 1–3 per mm., the edges thin, becoming lacerate with age; **cystidia** abundant or rare, hyaline or nearly so, ventricose, 8–15 $\mu$ in diameter, projecting up to 16 $\mu$, but usually entirely imbedded in the hymenium; basidia "4–7 $\mu$ broad" (Shope); **spores** hyaline, smooth, ellipsoid to ovoid, 4–7 x 3–4 $\mu$.

On stumps and logs of coniferous trees, recorded on hemlock, pitch pine, and spruce. Common. Summer and fall. Overholts (**8,** p. 35) records the spore measurements as 4–5 x 3–4 $\mu$, and some specimens appear to have spores all about that size, others have somewhat larger spores, 5.5–7 $\mu$ long. Though indicated, not enough material has been examined to determine if a large spored and a small spored form exist.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Atkinson, Cornell Univ. Agr. Exp. Sta. Bull. 193: 200, *f. 56,* p. 201. *f. 57,* p. 202, *f. 58,* p. 203, *f. 59,* p. 207, *f. 63.* 1901, and in Mushrooms, ed. 3, p. 9, *f. 9.* 1911; Lloyd, Synop. Apus Polyporus, p. 326, *f. 668–670.* 1915; Shope, Ann. Missouri Bot. Gard. 18: 418. *pl. 20.* 1931.

Type of rot: cuboidal heartwood rot of conifers, see Rankin (**12,** pp. 185–186).

**81. Polyporus delectans** Peck

*Spongipellis delectans* (Peck) Murr.

*Pileus tomentose to strigose, drying yellowish; margin thin, acute; pores 1–2 per mm.; spores 5–7 x 4–5.5 μ; on hardwoods.*

**Pileus** sessile or effused-reflexed, soft and watery when fresh, firm to rigid when dry, sometimes imbricate, 3–10 x 5–15 x 1–4 cm.; surface white to yellowish, finely tomentose to almost glabrous or, on drying, becoming coarsely and roughly short strigose, azonate; margin usually abruptly thinning, acute, sterile below; **context** white, often duplex when dry, soft and friable above, firm below, azonate, 0.5–2 cm. thick, the hyphae rarely branched, thin-walled, 4–5 μ in diameter; **tubes** white to pallid, 0.5–1.5 cm. long, the mouths white to yellowish, circular to sinuous, averaging 1–2 per mm., the edges thin, dentate to finely lacerate; cystidia none; basidia 5.5–7 μ in diameter; **spores** hyaline, smooth, often one-guttulate, ellipsoid to subglobose, 5–7 x 4–5.5 μ.

On old logs or growing from wounds in living trees, recorded on beech, hickory, elm, and maple. Rather rare. Late summer and fall.

NYBG; SM; CU; LM.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 325, *f. 667.* 1915; Overholts, Ann. Missouri Bot. Gard. 2: 728. *pl. 24, f. 11 b.* 1915.

**82. Polyporus obtusus** Berk.

*Spongipellis unicolor* (Schw.) Murr.; *Trametes unicolor* (Schw.) Murr.

*Pileus hirsute-tomentose, often drying brown; margin thick; pores 1 mm. or more wide; spores 6–8 x 5–6 μ; on hardwoods.*

**Pileus** sessile, spongy to firm, convex to ungulate, dimidiate, 3–10 x 4–20 x 3–6 cm.; surface white to yellowish or grayish, often brownish in dried specimens, hirsute-tomentose, rarely becoming glabrous, azonate; margin thick, obtuse, fertile below; **context** white, or brownish in dried specimens, sometimes duplex, spongy when fresh, firm to corky when dry, faintly zonate, 1–3 cm. thick, the hyphae rarely branched, very thick-walled, 4.5–6 μ in diameter; **tubes** white, or yellowish to light brown on drying, 1.5–3 cm. long, mouths concolorous or somewhat darker, circular to angular or sinuous, sometimes confluent, 1 mm. or more wide, the edges thin and fimbriate-dentate to slightly lacerate; cystidia none, or

represented by thin-walled, more or less flexuous bodies imbedded in the hymenium, or projecting up to 10 $\mu$, 3.5–5 $\mu$ in diameter; basidia 5–6.5 $\mu$ in diameter; **spores** hyaline, smooth, broadly ellipsoid to subglobose, 6–8 x 5–6 $\mu$.

On the wood of deciduous trees. New York is within the range of the species but it has not yet been reported for the state.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 324, *f. 666.* 1915, and in Mycol. Notes 67: *pl. 210, f. 2205.* 1922; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:160. *pl. 2, f. 11, a–c.* 1914 (as Daedalea); Overholts, Wash. Univ. Studies 3:88. *pl. 3, f. 13, a–b.* 1915; Spaulding, Ann. Rept. Missouri Bot. Gard. 16:116. *pl. 13–15.* 1905; von Schrenk and Spaulding, U. S. Dept. Agr. Bur. Plant Indus. Bull. 149:41. *f. 5.* 1909.

Type of rot: soft heartrot of oaks, see Spaulding, Rept. Missouri Bot. Gard. 16:109–116. 1905, or von Schrenk and Spaulding (**13,** pp. 41–42).

**83. Polyporus fissilis** Berk. and Curt.

*Spongipellis fissilis* (Berk. and Curt.) Murr.

*Pileus drying rough, wrinkled; context drying hard, strongly zonate; tubes usually darkening, collapsing.*

**Pileus** sessile, soft and watery when fresh, hard and rigid when dry, subimbricate or solitary, dimidiate to flabelliform, 4–6 x 7–15 x 1–2 cm.; surface white and minutely spongy tomentose when fresh, drying brownish discolored, wrinkled, setose or fibrillose to subglabrous, azonate; margin rather thin to thick, fertile below; **context** white and watery when fresh, drying sordid, fibrous, very hard, and conspicuously zonate, 5–10 mm. thick, composed of more or less parallel strands of thin-walled, rarely branching, adhering hyphae bound by a network of much branched hyphae, the hyphae 3–7 $\mu$ in diameter; large numbers of imbedded spores present in the context tissue; **tubes** white when fresh, on drying changing to brownish yellow or darkening to black and becoming resinous and collapsing into a rigid mass, 3–8 mm. long, mouths concolorous, angular, 1–2 per mm., the edges thin, nearly entire; cystidia none; basidia 6 $\mu$ in diameter; **spores**[1] hyaline, smooth, ovoid to subglobose, 5–7 x 3–5 $\mu$; "ovoid or ellipsoid, hyaline, 3.5–4.5 x 3–3.5 $\mu$" (Overholts).

On the trunks of deciduous trees, recorded only on maple. Very rare, one collection known, Tully, L. H. Pennington. The species is typically more southern in its distribution.

When dry compare 52. *P. croceus.*

LM; CF.

Illustrations: Dodge, Mycologia 8:14. *pl. 176.* 1916.

Type of rot: heartrot of apple, see Dodge, Mycologia 8:5–15. 1916.

[1] Most spores seen were undoubtedly from the context. One attached spore was seen. It did not differ appreciably from the free spores in the mount.

**Polyporus compactus** Overholts *Bull. Torrey Bot. Club* 49:170–172 and *pl. 9, f. 5–6.* 1922 has been collected in Pennsylvania and New Jersey and eventually, no doubt, will be found in New York State. The diagnostic characters of this species are apparently the narrowly reflexed pileus not more than 1 cm. broad and 1.5 cm. thick, or fruiting body resupinate, 3–8 mm. thick; surface of pileus white or gray, glabrous or nearly so; context "light wood color," compact and friable when dry; tubes short, mouths white, 3–4 per mm.; cystidia present; basidiospores ellipsoid to ovoid, hyaline, often with a slightly truncate apex, 7.5–9 x 4.5–6 $\mu$; chlamydospores (?) on the hymenium and on the hyphae of the context, broadly ellipsoid to subglobose, hyaline or slightly colored, 7.5–9 x 6–7.5 $\mu$ or 6–7.5 $\mu$ in diameter. On wood of oak. The above description is taken entirely from Overholts' description, as the writer has seen no specimens.

*2. Spores reniform.*

### 84. Polyporus epileucus Fries

*Pileus white or yellowish, rugose; pores small, 2–4 per mm.*

**Pileus** sessile or effused-reflexed, soft and watery when fresh, 1–2 x 1.5–5 x 0.3–0.6 cm.; surface white or yellowish, nearly glabrous, but rugose; **context** white, 1–4 mm. thick; **tubes** 1–3 mm. long, mouths white or yellowish, averaging 2–4 per mm.; cystidia none; **spores** "hyaline, smooth, reniform, 5 x 2.5 $\mu$" (Lloyd) ("or 3.5 x 2 $\mu$ for American plants." Lloyd).

On the wood of deciduous trees, recorded on black oak and oak unclassified. Fall. Rare.

The determinations of all the collections of this species have been made by Lloyd. The above description is in the sense of Lloyd and is adapted from Overholts (**8**, p. 38), with the exception of the American spore record which is taken from Lloyd (**6**, p. 310). Dr. Overholts informs me by letter that his description was based upon specimens in Lloyd's herbarium.

?CU; LM.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 310, *fig. 649.* 1915.

Through the courtesy of Mr. Roy Latham the writer has been able to examine a part of a collection determined as *P. epileucus* by Lloyd. While the specimens are small and poorly developed they present all the characters of *P. semisupinus* as described in this manual. The spores are ellipsoid to ovoid, 3 x 2–2.5 $\mu$. Apparently *P. epileucus* is not well understood either in Europe or in this country. See Romell (*Svensk Botanisk Tidskrift* Bd. 20, Heft 1, p. 10. 1926) and Bourdot and Galzin (**1**, p. 543) for the present European interpretation of this species.

*3. Spores allantoid or cylindrical to cylindric-ellipsoid.*
*a. Spores allantoid, or at least slightly curved; pileus when fresh unchanging or turning bluish where bruised.*

### 85. Polyporus semipileatus Peck

*Tyromyces semipileatus* (Peck) Murr.; *P. semisupinus* Berk. sense of Lloyd

*Pileus thin, narrowly effused-reflexed; pores 4–6 per mm.*

**Pileus** effused-reflexed, usually largely resupinate, spongy and watery when fresh, rigid when dry, dimidiate to elongate, 0–1.5 x 1–4 x 0.2–0.5 cm.; surface white, yellowish, "or reddish brown"

(Overholts), minutely tomentose to glabrous, azonate; margin thin, acute, narrowly sterile below; **context** white or whitish, soft when fresh, firm when dry, 1–4 mm. thick, the hyphae rarely branched, rather thin-walled, 3–5 $\mu$ in diameter; **tubes** less than 2.5 mm. long, mouths white or whitish, "or greenish, or somewhat violaceous" (Overholts), angular, averaging 4–6 per mm., the edges thin, entire; cystidia none, "or represented by tufts of hyaline projecting hairs" (Overholts); basidia 3–4 $\mu$ in diameter; **spores** hyaline, smooth, allantoid, 3–4 x 1 $\mu$.

On the wood of deciduous trees, recorded on beech, black cherry, mountain maple, red maple, and maple unclassified. Uncommon. Summer and fall. European authorities place this species in synonymy with *P. chioneus* Fries sense Bresadola.

NYBG; SM; CU; LM; CF.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 316, *f. 654–655.* 1915 ( as *P. semisupinus*); Overholts, Wash. Univ. Studies 3:90. *pl. 4, f. 18, a–b.* 1915.

### 86. **Polyporus albellus** Peck

*Tyromyces chioneus* (Fries) Karst. sense No. Amer. Flora 9:35. 1907.

*Pileus sessile, when dry with a yellowish, thin, distinct pellicle.*

**Pileus** sessile, soft and watery when fresh, rigid when dry, dimidiate, 2–8 x 2–8 x 1–4 cm.; surface white to yellowish or grayish, glabrous or nearly so, covered with a thin yellowish pellicle which is more evident in dried specimens, sometimes disappearing in patches, azonate; margin acute, sterile or fertile below; **context** white, soft and friable when dry, faintly zonate, 0.5–3 cm. thick, the hyphae rarely to often branched, 4–7 $\mu$ in diameter; **tubes** white or whitish, 4–9 mm. long, the mouths white to yellowish, more or less circular, averaging 3–4 per mm., the edges entire to very slightly fimbriate; cystidia none; basidia 4.5–5.5 $\mu$ in diameter; **spores** hyaline, smooth, allantoid, 3–4 x 1–1.5 $\mu$.

On the wood of deciduous trees, recorded on beech, sweet birch, birch unclassified, fire cherry, and oak. Common. Summer and fall.

NYBG; SM; LM; CU; CF; MU.

Illustrations: Overholts, Ann. Missouri Bot. Gard. 2:726. *pl. 23. f. 5,* and p. 728, *pl. 24, f. 16 a.* 1915.

*Polyporus albellus* and *P. lacteus* (=*P. trabeus* sense of Lloyd) grade into each other in every character. The writer believes with Lloyd (**6**, p. 295) that these are but extreme forms of the same species. See OBSERVATIONS under *P. chioneus* and the note under 88. *P. tephroleucus.*

### 87. **Polyporus lacteus** Fries

*Tyromyces lacteus* (Fries) Murr.; *Polyporus trabeus* Fries sense Lloyd

*Pileus sessile or reflexed, drying whitish, without a pellicle.*

**Pileus** sessile or effused-reflexed, soft and watery when fresh, becoming rigid and fragile when dry, dimidiate, 1–4 x 2–8 x 0.5–

1.5 cm.; surface grayish when fresh, becoming white or slightly discolored on drying, dull, finely tomentose or pubescent to nearly glabrous, azonate, without a pellicle; margin abruptly thin, sterile below; **context** grayish when fresh, white when dry, spongy-fibrous when fresh, friable when dry, 5–10 mm. thick, the hyphae rarely branched, thick-walled, 4–8 $\mu$ in diameter; **tubes** white, 3–10 mm. long, mouths white to pallid, circular to angular, averaging 4–5 per mm., the edges very thin, dentate to slightly lacerate; cystidia none; basidia 3–4.5 $\mu$ in diameter; **spores** hyaline, smooth, allantoid, 3.5–5 x 1–1.5 $\mu$.

On the wood of deciduous trees, recorded on white ash, beech, hard maple, maple unclassified, black oak, and on pine and red cedar (both doubtful). Summer and fall.

NYBG; SM; CU; LM; CF; BM.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 300, *f. 638.* 1915 (as *P. trabeus*).

**88. Polyporus tephroleucus** Fries

*Pileus applanate, gray or brown, glabrous; pores 4–5 per mm.*

**Pileus** soft and watery when fresh, rigid when dry, applanate, 1–7 x 2–8 x 0.5–1.5 cm.; surface light brown or decidedly gray (not white), glabrous or nearly so; **context** white, 3–10 mm. thick; **tubes** 2–7 mm. long, mouths white or whitish, angular, averaging 4–5 per mm.; cystidia none; **spores** hyaline, smooth, allantoid, 4–5 x 0.7–1.5 $\mu$.

On the wood of deciduous trees. The pileus is similar in appearance to *P. fumidiceps* but bears entirely different spores. The above description is adapted from Overholts (**8,** p. 37). As indicated by Bourdot and Galzin (**1,** p. 540) the species seems closely related to *P. lacteus* and differs (according to the descriptions) only in the darker upper surface of the pileus.

In his latest paper Overholts (**16,** pp. 15, 21, 27) separates *P. tephroleucus* from *P. albellus* by the presence of nearly or entirely unbranched hyphae, as compared with the very much branched hyphae of *P. albellus.* As now defined by him *P. tephroleucus* appears to include *P. tephroleucus* and *P. albellus* of his earlier paper (**8,** pp. 36, 37), while the name *P. albellus* is applied to the species there described under the name *P. chioneus* Fries.

LM.

Illustrations: Lloyd, Mycol. Notes 61: *pl. 128, f. 1527.* 1919 (as var. *scruposus*).

**89. Polyporus caesius** (Schrad.) Fries

*Tyromyces caesius* (Schrad.) Murr.; *T. caesiosimulans* Atk.; *Polyporus caesiosimulans* Atk.

*Pileus sessile or reflexed, usually villous-pubescent or strigose; tubes often bluish; spores bluish gray in mass.*

**Pileus** sessile or effused-reflexed, soft and watery when fresh, rigid when dry, dimidiate, when fresh sometimes turning bluish

where bruised, 1–5 x 1–6 x 0.5–2 cm.; surface white or grayish, rarely bluish gray, villous-pubescent or strigose, or varying to nearly glabrous, azonate; margin thin and acute, fertile below; **context** white, soft and watery when fresh, firm-friable when dry, 3–10 mm. thick, the hyphae sparingly branched, thick-walled, 4–7 $\mu$ in diameter; **tubes** white or bluish, 2–7 mm. long, mouths white or grayish blue, unequal, angular, averaging 3–4 per mm., the edges thin, becoming lacerate; cystidia none; basidia "4–6 $\mu$ broad" (Shope); **spores** bluish gray in mass, hyaline under the microscope, smooth, slightly curved to allantoid, 3–5 x 1–1.5 $\mu$.

On the wood of deciduous or of coniferous trees, recorded on apple, birch, willow, and conifer unclassified. Frequent. Summer and fall. The bluish gray color of the tubes is one of the best characters to distinguish the plant from closely related sessile white species.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Overholts, Wash. Univ. Studies 3:86. *pl. 2, f. 8, a–b.* 1915; Shope, Ann. Missouri Bot. Gard. 18:434. *pl. 28, f. 3.* 1931.

*Polyporus* (*Tyromyces*) *caesiosimulans* Atk. *Ann. Mycol.* 6:61. 1908. Described as "A small, thin, soft plant..., resembling *Polyporus caesius* but differing in the globose, pedicellate spores." Through the kindness of Dr. H. M. Fitzpatrick of Cornell University, a portion of the type collection was available for examination. Spores of the type described by Atkinson ("minute, globose, hyaline, smooth, minutely pedicellate, 3–4 $\mu$") were abundant in the mount. Such spores were demonstrated to be borne on long filiform hyphae which arose from the hymenial layer. Similar slender hyphae were found in the hymenial layer, but a direct connection between these was not demonstrated with certainty. Spores of the size and shape typical for *P. caesius* were found in the mounts, especially where the spores of the globose type were scarce or lacking. The hymenial layer was not at all distinct, and a basidium was not demonstrated even after repeated attempts. The slender hyphae and globose spores appear to belong to a foreign fungus which grew in the hymenium of the polypore, rather than to be conidiophores and conidia of the polypore. It is probable, therefore, that *P. caesiosimulans* was based upon a specimen of *P. caesius* contaminated with another fungus.

*b. Spores allantoid or cylindrical to cylindric-ellipsoid; pileus when fresh turning reddish or brownish where bruised, or changing on drying.*

### 90. Polyporus mollis (Pers.) Fries

*Spores 4.5–5.5 x 1.5–2 $\mu$, allantoid; pileus large, sessile.*

**Pileus** sessile, soft and watery when fresh, rigid and fragile when dry, often imbricate, dimidiate, when fresh quickly turning red wherever bruised, the whole fruiting body turning dull red or at least pinkish on drying, 1–3 x 3–8 x 1–3 cm.; surface white when fresh, finely appressed-fibrillose when fresh, glabrous and smooth to minutely reticulate when dry, usually with a thin pellicle, azonate; margin rather thick, acute, fertile below, sometimes blackening on drying; **context** white when fresh, changing quickly on bruising, pinkish and spongy to firm when dry, 0.5–

2.5 cm. thick, the hyphae rarely branched, thick-walled to sometimes thin-walled, 4–5.5 $\mu$ in diameter; **tubes** white when fresh, drying pinkish red to dark red, 2–5 mm. long, mouths concolorous, sinuate, 2–3 per mm. (when dry), the edges thin and uneven; cystidia none; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, allantoid, 4.5–5.5 x 1.5–2 $\mu$.

On the wood of coniferous trees. Rare.

SM; LM.

### 91. **Polyporus fragilis** Fries

*Spongipellis fragilis* (Fries) Murr.

*Spores 4.5–5.5 x 1.5–2.5 $\mu$, usually straight; pileus small, often effused-reflexed.*

**Pileus** sessile or more often effused-reflexed, fleshy and rather soft when fresh, becoming hard and fragile when dry, dimidiate, when fresh quickly turning dark red wherever bruised, the whole fruiting body turning dull red on drying, 2–4 x 3–7 x 0.5–1.5 cm.; surface white or whitish when fresh and unbruised, finely tomentose to nearly glabrous, azonate; margin thin, sometimes blackening on drying, fertile below; **context** white when fresh, reddish when bruised and when dry, soft when fresh, drying firm but very friable, 0.2–1 cm. thick, the hyphae occasionally to rarely branched, thin-walled, 4–7 $\mu$ in diameter; **tubes** white when fresh, when bruised and on drying pinkish red to dark red, 2–7 mm. long, mouths concolorous, circular to angular, becoming sinuous or labyrinthiform, averaging 3–5 per mm., the edges thin, uneven; cystidia none; basidia 4.5–5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical and straight, occasionally allantoid, 4.5–5.5 x 1.5–2.5 $\mu$.

On the wood of coniferous trees, recorded on balsam, hemlock, and white pine. Rare. Summer and fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 319, *f. 661.* 1915; Shope, Ann. Missouri Bot. Gard. 18:426. *pl. 24, f. 1.* 1931.

### 92. **Polyporus ursinus** Lloyd

*Spores 8–10 x 2.5–3.5 $\mu$; pileus fibrillose; cystidia present.*

**Pileus** effused-reflexed or sessile, spongy, tough, drying hard, dimidiate, solitary or imbricate, 1–5 x 2–10 x 0.5–2.5 cm.; surface at first whitish or pinkish, turning with age or on bruising to a reddish or brownish color, radially appressed-fibrillose to tufted-fibrillose, glabrous with age, azonate; margin thick, obtuse, fertile below; **context** white to pinkish, soft, becoming very hard on drying, 0.5–2 cm. thick, the hyphae frequently branched, irregular, thick-walled, 4–8 $\mu$ in diameter; **tubes** white, discoloring to reddish on drying, 2–7 mm. long, mouths angular to sinuate, averaging 1–3 per mm., the edges rather thin, slightly lacerate with age; **cystidia** numerous, cylindrical, 5–7 $\mu$ in diameter, projecting up to

30 $\mu$, "with age becoming incrusted at their apexes" (Shope); basidia "5–8 $\mu$ broad" (Shope); **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, 8–10 x 2.5–3.5 $\mu$.

On the wood of coniferous trees. Fall. Rare.

Overholts (**16**, p. 25) applies the name *P. lapponicus* Romell to this species. Romell's original description agrees very well with the American plant and it is probable that the two species are synonymous.

SM; LM; CF; MU.

Illustrations: Lloyd, Synop. Apus Polyporus, p. 319, *f. 659–660.* 1915; Shope, Ann. Missouri Bot. Gard. 18:416. *pl. 19, f. 5–8.* 1931.

*c. Spores cylindrical to subellipsoid; pileus when fresh unchanging where bruised.*

*(1) Spores 6–9 $\mu$ long.*

### 93. Polyporus anceps Peck

*Tyromyces anceps* (Peck) Murr.

*Pileus reflexed or resupinate, 0–3 cm. wide, 0.5–1.5 cm. thick.*

**Pileus** effused-reflexed or resupinate, subcoriaceous when fresh, rigid when dry, often subimbricate, 0–3 x 3–7 x 0.5–1.5 cm.; surface white or whitish, often with small reddish spots, nearly glabrous, uneven with small tubercles or slightly pitted or wrinkled; margin slightly reddish where bruised, obtuse to acute, fertile below; **context** white, fibrous-tough when fresh, firm-corky when dry, 1–5 mm. thick, the hyphae thick-walled, of two kinds, some rarely branched, 3–6.5 $\mu$ in diameter, others often and sometimes intricately branched, 1–3 $\mu$; **tubes** decurrent, white, remaining white, 4–10 mm. long, mouths white or occasionally yellowish stained where bruised, circular, averaging 3–4 per mm., the edges entire; cystidia none; basidia 5–7.5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 7–9 x 3–3.5 $\mu$.

On the wood of coniferous trees, recorded only on pitch pine. Rare. Fall.

SM; LM.

Illustrations: Kauffman, Mycologia 18:30. *pl. 5.* 1926; Lloyd, Mycol. Notes 47:655. *f. 933–934.* 1917; Shope, Ann. Missouri Bot. Gard. 18:424. *pl. 23, f. 2.* 1931.

Type of rot: red ray rot of coniferous wood, see Hubert (**2**, pp. 333–340).

### 94. Polyporus palustris Berk. and Curt.

*Tyromyces palustris* (Berk. and Curt.) Murr.

*Pileus sessile, 2–6 cm. wide, 0.5–2.5 cm. thick.*

**Pileus** sessile, fleshy-tough to rigid and somewhat fragile when dry, dimidiate, 2–6 x 5–10 x 0.5–2.5 cm.; surface white to slightly

yellowish, smooth, glabrous, sometimes rough and tubercular behind; margin thin to thick, becoming more or less reddish on drying, narrowly sterile or fertile below; **context** white, fibrous-fleshy when fresh, firm and somewhat friable when dry, 0.3–2 cm. thick, the hyphae rarely branched, thick-walled, 3.5–6 $\mu$ in diameter; **tubes** white to slightly yellowish within, 2–6 mm. long, mouths white to yellowish, circular to angular, averaging 4–5 per mm., the edges rather thin, entire to dentate; cystidia none; basidia 5–6.5 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, cylindrical, 6–9 x 2.5–3 $\mu$.

On the wood of coniferous trees, recorded on pitch pine and on white pine. Rare. Summer. The species is typically much more southern in its distribution.

SM; LM; CF; MU.

Illustrations: Lloyd, Mycol. Notes 48:680. *f. 1014.* 1917.

*(2) Spores 3–6 $\mu$ long.*

### 95. **Polyporus guttulatus** Peck

*P. maculatus* Peck; *Tyromyces guttulatus* (Peck) Murr.

*Context drying soft, friable; pileus sessile, often spotted.*

**Pileus** sessile, soft and fleshy when fresh, rigid when dry, sometimes imbricate, dimidiate or sometimes narrowly attached and flabelliform, usually thin and applanate, 3–7 x 5–12 x 0.4–1.5 cm.; surface white to yellowish or slightly brownish, glabrous, often marked by round depressed spots, sometimes faintly zonate, usually with a thin pellicle when dry; margin thin, acute, sterile below; **context** white, soft and fleshy when fresh, rather soft and friable when dry, 0.2–1 cm. thick, the hyphae rarely branched, thick-walled, 5–8 $\mu$ in diameter; **tubes** white, sometimes darkening on drying, 1–5 mm. long, mouths white to ochraceous, occasionally darker, angular, averaging 4–6 per mm., the edges thin, entire to lacerate; cystidia none; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 3–5 x 2.5–3.5 $\mu$.

On the wood of coniferous trees, recorded on balsam, hemlock, white pine, spruce, and on beech (doubtful). Frequent. Summer and fall. Lloyd (**6,** p. 301–302) places this species in synonymy with *P. alutaceus* Fries of Europe. The one European specimen so determined that I have seen was in poor condition and insufficient to warrant any conclusions.

NYBG; SM; CU; LM; CF; MU.

### 96. **Polyporus trabeus** Rostk.

*Context drying soft, friable; pileus usually reflexed, streaked.*

**Pileus** narrowly reflexed or often resupinate, soft and watery to fleshy-fibrous when fresh, drying firm and fragile, sometimes at least with a slight fragrant odor when fresh, usually laterally confluent, 0.4–0.6 x 1–6 x 0.2–0.5 cm.; surface when fresh white and

minutely pubescent, on drying discoloring to cream with narrow, radially arranged brownish streaks, nearly glabrous, azonate to slightly zonate; margin thin, acute, often reddish resinous when dry, narrowly sterile or fertile below, in resupinate specimens minutely pubescent, on drying detaching and curling away from the substratum; **context** white, fleshy-fibrous when fresh, on drying becoming soft and very friable, 0.25–1 mm. thick, the hyphae rarely branched, thick- or thin-walled, 2.5–5 $\mu$ in diameter; **tubes** white, becoming dingy yellowish on drying, 1–4 mm. long, mouths concolorous, regularly angular to elongated and subsinuous, averaging 3–4 per mm., sometimes the dissepiments breaking down to form occasional larger pores, the edges thin, extremely fragile, entire or more often fimbriate to lacerate; cystidia not observed; basidia 5–5.5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, straight to slightly curved, 4.5–6 x 1–2 $\mu$.

On the wood of coniferous trees, recorded only on spruce. Very rare, collected but once, Seventh Lake, Adirondacks, September 16, 1921, C. H. Kauffman[1]. Known to the writer from New York State and from Isle Royale, Michigan, and elsewhere not described in American mycological literature, so far as the writer is aware.

MU.

### 97. **Polyporus albidus** (Schaeff.) Fries

*P. epileucus* var. *candidus* Peck

*Context drying firm; pileus when dry chalky-friable; on conifers.*

**Pileus** sessile, spongy when fresh, drying firm to rigid, convex, 1.5–4 x 2.5–9 x 0.6–1.5 cm.; surface white or whitish, when dry sometimes somewhat yellowish, often with small areas appearing resinous orange, usually more or less chalky in appearance and rubbing off like chalk, smooth, or roughened with small tubercles, or pitted, azonate; margin sometimes resinous orange when dry, acute, thickened behind, fertile below; **context** white, spongy when fresh, firm to rather hard when dry, 3–7 mm. thick, the hyphae usually thick-walled, rarely branched, 3.5–6 $\mu$ in diameter; **tubes** concolorous with the context or slightly darker, 2–5 mm. long, mouths white to yellowish, angular, averaging 4–6 per mm., the edges thin, entire; cystidia none; basidia 4.5–5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical to subellipsoid, sometimes narrowed at one end, 3–4.5 x 2–2.5 $\mu$.

On the wood of coniferous trees, recorded only on hemlock. Rare. Summer and fall. Most of Peck's determinations under *P. epileucus* should be referred here.

[1] The collection reported in *N.Y.S. Mus. Bull.* 131:25. 1909 was not found at Albany. The notes with this report indicate a different species than the one here described, apparently a species close to *P. trabeus* sense of Lloyd, which in this manual is described under the name of *P. lacteus*. The original figure and description of *P. trabeus* by Rostkovius (*in* Sturm's *Deutschl. Flora* Abt. III, Band IV, pp. 59, 60 and *t. 28.* 1838) admit a much thicker pileus than is here described. See also *Ann. Mycol.* 6:37. 1908, and Bourdot and Galzin (**1**, p. 541).

Additional material examined since this and the following specific description were submitted to the printer now inclines the writer to consider *P. immitis* a synonym of *P. albidus*. The pileus surface characters and host differences do not appear to hold. In addition Romell's specimen of *P. albidus* deposited in the Farlow Herbarium at Harvard University is almost exactly like the type specimens of *P. immitis*. See Romell (*Svensk Botanisk Tidskrift*, Bd. 20, Heft 1, pp. 2–5. 1926) and Bourdot and Galzin (**1**, p. 545) for an account of *P. albidus* as it is understood in Europe. The two descriptions have been kept separate to avoid confusion and also to retain the description of *P. immitis*, which was based in part on the type material.

SM; LM; CF; MU.

Illustrations: Lowe, Papers Michigan Acad. Sci., Arts, Lett. 19. *pl. 14, f. 1–3.* 1934.

### 98. Polyporus immitis Peck

*Spongipellis galactinus* (Berk.) Pat. of No. Amer. Flora 9:39. 1907 in part.

*Context drying firm; pileus hispid or tubercular; on hardwoods.*

**Pileus** sessile, soft and watery when fresh, rigid and brittle when dry, applanate to somewhat convex, imbricate or solitary, more or less aromatic when fresh, 3–10 x 3–10 x 0.5–3 cm.; surface white, becoming tinged with yellow or brownish on drying, fibrous-hispid or tubercular when dry, more or less rough and uneven, azonate or very slightly zonate; margin thin, acute, fertile below; **context** white, homogeneous or sometimes duplex, soft-spongy and friable above, firm and fibrous below, 0.4–2 cm. thick, the hyphae occasionally branched, usually thick-walled, 3–4 $\mu$ in diameter; **tubes** white when fresh, sometimes changing to ochraceous or olivaceous brown on drying, 3–10 mm. long, mouths concolorous, angular to slightly sinuous, 5–6 per mm., the edges thin, at length dentate or lacerate; cystidia none; basidia 5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 3.5–5 x 1.5–2 $\mu$.

On the wood of deciduous trees, often ash, recorded on apple, black ash, ash unclassified, and yellow birch. Rather rare. Summer.

SM; CU; CF; MU.

OBSERVATIONS

*Amesii* Lloyd, *Polyporus*. Reported and described by Lloyd in Lloyd *Letter* 60:1 and Note 327, p. 9, 1915, and in (**6**, p. 309). Apparently a form of *P. fumosus*.

*amygdalinus* Berk. and Rav., *Polyporus*. Collected at Greenport, Long Island, by Roy Latham, determined by Lloyd and reported in Lloyd *Letter* 63:14. Note 495. 1916 and in *Torreya* 17:117. 1917. Through the courtesy of Mr. Latham a specimen from the original collection was available for examination. Mr. Latham's specimen has an entirely different appearance than the specimen from R. P. Burke, Alabama (considered authentic by the writer) at the herbarium of the New York Botanical

Garden. Mr. Latham's specimen shows exactly the characters of a sessile form of *Polyporus distortus* in which the outer spongy portion of the context is well developed (5 mm. thick) and the inner firm portion is much reduced (0.25–0.3 mm. thick). The writer has no hesitation in referring Mr. Latham's specimen to *P. distortus*. It appears, therefore, that the New York State record of this southern species is in error.

*biformis* (Klotzsch) Pat., *Coriolus*, sense Murrill in *Mycologia* 12:7. 1920. Change of name for *P. pargamenus*.

*caesarius* Fries, *Polyporus*. Reported in *N.Y.S. Mus. Rept.* 43:67(21). 1890. Typographical error for *P. cascarius*. Not found at Albany. Near *P. sulphureus*.

*cascarius, Polyporus*. CU No. 22024 and 22024A. Is *P. galactinus*.

*carolinensis* B. and C., *Polyporus*. Reported by Peck in *N.Y.S. Mus. Rept.* 22:83. 1869. As stated by Lloyd (Lloyd *Mycol. Notes* 29:379. 1908) the Albany specimen is *P. biformis*.

*cerifluus* Berk. and Curt., *Polyporus*. Specimen so reported in *N.Y.S. Mus. Rept.* 22:83. 1869 is *P. borealis*.

*chioneus* Fries, *Polyporus*. This specific name has been used by Murrill (**7**, p. 35) instead of *P. albellus*, and by Overholts as a designation of a species distinct from *P. albellus*. Overholts (**9**, pp. 697–701, and **11**, p. 1706) states that the hyphae of the context of *P. albellus* Peck is simple or very rarely branched; the hyphae of *P. chioneus* much branched. The writer was unable to find the type collection of *P. albellus* (from the Helderberg Mountains) at Albany. The box labelled "type" contains specimens from the Adirondack Mountains. There are four additional collections so named by Peck and in the absence of the type these should stand as the authentic specimens of *P. albellus*. The hyphae of all the specimens of these collections are much branched. Overholts' concept of *P. albellus* therefore should not be maintained. The writer believes, from his studies of these species, that the branching of the hyphae is too unreliable a character to serve as a specific distinction, and the description of *P. albellus* in this manual admits specimens with rarely branched to often branched hyphae.

In his latest paper Overholts (**16**, p. 21) applies the name *P. albellus* to the species described in his earlier papers (**8** and **9**) under the name *P. chioneus*.

*circinans, Polyporus*. Reported in Lloyd *Mycol. Notes* 64:1018. 1920. Collected by L. H. Pennington. Dr. John Stevenson writes of this specimen in the Lloyd Herbarium, "*Polyporus circinans* is clearly an error for *P. circinatus*. Pennington's specimen is clearly to be referred to the latter species and it is so placed in the herbarium."

*conglomeratus* Peck, *Polyporus*. As reported in *N.Y.S. Mus. Rept.* 38:111. 1885 a typographical error for *P. glomeratus*.

*connatus* Schw., *Polyporus* (*Polystictus*). According to Lloyd (Lloyd *Letter* 50:5. 1913) the type specimen is *P. perennis*, but the name has been applied to *P. focicola* in the earlier American mycology. But CU specimen no. 20348 (Smithtown, L.I.) and Clearwater specimen (at CU) are *Fomes connatus;* specimen reported in *Torreya* 25:32. 1925 not examined.

*dealbatus, Polyporus*. CU no. 19860 (from Ithaca, N.Y.). Unknown to me, but scarcely the same as Ravenel's exsiccatae specimen (from South Carolina) in CU herb. (no. 836). Lloyd has placed with Ravenel's specimen a note reading, "small specimen but only collection known."

*destructor* Schrad., *Polyporus*. Reported in Lloyd *Letter* 61:1. 1916. The following description is adapted from Lloyd (**6**, p. 303).

Pileus effused-reflexed, watery, fleshy, drying soft and brittle; pores white, drying discolored brownish, small, round, fragile; spores elliptical, 4–5 x 3–3.5 $\mu$.

Sent from New York State by F. H. Ames. "The main difference, by which the plant can be told from similar species, is the discoloring of the dried pores." (Lloyd)

*elongatus* Berk., *Polyporus.* Albany specimens are *P. pargamenus.*

*fibula, Polyporus.* CU no. 2822. Spores not demonstrated; all other characters those of *P. galactinus.* Overholts (**8,** p. 52) says of *P. fibula* "now referred to *P. pubescens,* at least American specimens so determined."

*hirsutellus, Polystictus.* Reported in Lloyd *Letter* 69:10. 1919. Dr. John Stevenson writes of this specimen in the Lloyd Herbarium "*Polyporus hirsutellus*.... is in error for *P. hirsutulus* and the specimen..... is filed under the latter name."

*Holmiensis* Fries, *Polyporus.* Reported in Lloyd *Letter* 67:3. 1918; described and figured in (**6,** p. 308, 309). Apparently a thick form of *P. fumosus* with dark lines running through the context.

*intybaceus* Fries, *Polyporus.* Specimens so reported are usually *P. frondosus.* The collection reported under this name by Kauffman in *N.Y.S. Mus. Bull.* 179:90. 1915 should be referred to *P. osseus.* Lloyd's note on this species based on Kauffman's specimen (Lloyd *Letter* 58:6. Note 276. 1915) thus rested upon a misconception, as was partly recognized by him in Lloyd *Letter* 60:9. Note 329. 1915.

*labyrinthicus* Fries, *Polyporus.* Reported by Peck on pine in *N.Y.S. Mus. Rept.* 22:82. 1869. Specimen not found at Albany. The species is considered to be a synonym of *P. obtusus* or perhaps of *P. delectans* by Lloyd (**6,** p. 381). Neither of these occur upon a coniferous substratum, however.

*laceratus* Berk., *Polyporus.* Albany specimens are *P. pargamenus.* Listed by Murrill (**7,** p. 27) and by Shope (**15,** p. 329) as a synonym of *P. pargamenus.*

*Lloydii* (Murr.) *Polystictus.* CU no. 18929. Collected on mine timbers, scarcely determinable. *P. Lloydii* is referred by Lloyd to *P. Grayii,* a synonym of *P. pubescens.*

*ludovicianus* (Pat.) Sacc. and Trott., *Polyporus.* Reported in Lloyd *Mycol. Notes* 64:1020. 1920. Listed by Lloyd (**6,** p. 381) as a synonym of *P. cuticularis.* See also Lloyd *Letter* 67:13. Note 661. 1918.

*luridus* Berk. and Curt., *Polyporus.* Collections so referred belong under *P. brumalis.* Listed as a synonym of *P. brumalis* by Lloyd (**4,** p. 178) and by Murrill (**7,** p. 56).

*molliusculis* Berk., *Polystictus.* CU no. 6. Misdetermination for *P. immitis. Coriolus molliusculis* (Berk.) Murr. in *Northern Polypores* (1914), p. 8 a change of name for *P. biformis.*

*nigropurpurascens* (Schw.), *Polyporus.* Change of spelling for *P. nigropurpurea.* Specimens at Albany and Buffalo variously referable to *P. dichrous* and to species of Poria. See Overholts' redescription of the types of this species in *Mycologia* 15:217. 1923.

*niveus* Fries, *Polyporus.* As reported in Saccardo *Syll. Fung.* 6:118. 1888 is a "lapsus" for "rutilans", according to Lloyd (**6,** p. 383).

*oblectans* Berk., *Polystictus.* Specimen at Albany is *P. cinnamomeus.* See discussion of this species in Lloyd's *Polyporoid Issue* No. 1, p. 7, footnote 10, 1908.

*ochraceus, Polyporus,* and form *albidus.* Lloyd's name for the light colored forms of *P. hirsutus.* See Lloyd *Letter* 49:12. Note 137. 1914.

*Oerstedii* Fries, *Polyporus.* Reported in Lloyd *Letters* 44:1. 1913; 45:1. 1913; and in 49:1. 1914. Each time indicated by him to be equal to *P.* (*Ganoderma*) *sessile.*

*parvulus* Klotzsch, *Polyporus.* According to Lloyd (*Polyporoid Issue* No. 1, p. 7. 1908) the type specimen is *P. cinnamomeus,* but in American mycology the name is usually applied to specimens of *P. focicola.* The Albany specimen is *P. focicola.*

*perplexus* Peck, *Polyporus.* The type collection has been lost. Usually considered synonymous with *P. cuticularis.* Lloyd (Lloyd *Letter* 39:7. 1912) believed the species distinct. Most collections so referred are *P. cuticularis* of this manual.

*polycephalus* Lloyd, *Polystictus cinnamomeus* var. Named and illustrated in Lloyd *Mycol. Notes* 71:1261 and *fig. 2761*. 1924. Apparently a form of *P. cinnamomeus* with branched stems and confluent pilei.

*pseudoparyamenus* Thuem., *Polyporus*. Specimens at Albany so referred are *P. pargamenus*. Listed by Murrill (**7**, p. 27) and by Shope (**15**, p. 330) as a synonym of *P. pargamenus*.

*rigens*, *Polystictus*. Reported in Lloyd *Letter* 69:4. 1919. Sent by W. H. Ballou. In Saccardo *Syll. Fung.* 6:274. 1888 name used instead of *Trametes rigida* Berk. and Mont. Dr. John Stevenson writes from the Lloyd Herbarium "There are no specimens at this time in the Lloyd Herbarium under this name (*P. rigens*) or *Trametes rigida* from W. H. Ballou." *P. rigens* CU no. 2987 is *Trametes mollis*. See OBSERVATIONS under *Trametes rigida*, p. 101.

*rubiginosus* Rost., *Polyporus*. Reported by Peck in *N.Y.S. Mus. Rept.* 24:79. 1872. Not found at Albany. This species is placed in synonymy with *P. resinosus* Schrad. and the above report is cited as also belonging under *P. resinosus* in *Bull. Buffalo Soc. Nat. Sci.* 4:183. 1883.

*salignus*, *Polyporus*. Reported in Lloyd *Letter* 30:1. 1911. No specimens seen. According to Lloyd (**6**, p. 308) a form of *P. fumosus*, but in the report of this specimen the spores were recorded as "globose, 4–4½, hyaline, smooth." The spores of *P. fumosus* are cylindrical to cylindric-ellipsoid, 4.5–6 x 2–3 $\mu$.

*Sartwellii* Berk. and Curt., *Polyporus*. Described from a New York State specimen in *Grevillea* 1:51. 1872. Listed as a synonym of *P. pargamenus* by Murrill (**7**, p. 27) and by Shope (**15**, p. 330). Lloyd (Lloyd *Mycol. Notes* 32:423. 1909) says of a specimen in Fries' herbarium "it appears to me to be close to a *rigid* Daedalea unicolor except that the pores are polyporoid."

*scruposus* Fries, *Polyporus*. CU no. 3381 and no. 5142 are forms of *P. gilvus* with rough upper surface.

*setigera* Peck, *Poria*. According to Overholts closely related to and probably a young stage of *Polyporus glomeratus*. See (**10**, p. 109, 110) and in *Mycologia* 23:128. 1931.

*sinuosus* Fries, *Polyporus*. Reported by Peck in *N.Y.S. Mus. Rept.* 40:54 (52). 1887. Specimen at Albany changed to *Poria sinuosa*. The specimen does not agree with the description (as Trametes) in Rea, *British Basid.*, p. 616. Unknown to me.

*stipticus* (Pers.), *Polyporus*, sense of Lloyd. Reported in Lloyd *Letter* 66:4. 1917. Another collection so referred in CU herbarium, no. 18153. Lloyd's specimens not seen. The following description is adapted from Lloyd (**6**, p. 321):

Pileus sessile, dimidiate, 1.5 x 3 x 4 (inches?); surface white, dull, smooth, with no distinct crust; margin rufescent; context white, drying hard; tubes white, slightly rufescent on drying, 6–8 mm. long, mouths at first round, small, becoming larger and irregular when old; spores guttulate, elliptical and slightly curved, 3–4 x 1.5 $\mu$.

On the wood of deciduous trees, reported on black oak, Orient, Long Island, Roy Latham (see *Torreya* 21:9. 1921). CU specimens fragmentary, not determinable.

A specimen in the herbarium of the New York Botanical Garden, from Europe and determined by Bresadola as *P. stipticus*, is very similar if not identical with *P. anceps* as described in this manual. Concerning Bresadola's conception of this species see Romell in *Svensk Botanisk Tidskrift* Bd. 20, Heft 1, p. 7. 1926.

*subflavus* Lév., *Polyporus*. *Ann. Sci. Nat. Bot.* III. 5:300. 1846. Type from New York State. Listed by Murrill (**7**, p. 27) and by Shope (**15**, p. 330) as a synonym of *P. pargamenus*.

*subfuscus* Fries, *Polyporus*. Reported in *N.Y.S. Mus. Rept.* 22:83. 1869. Not found at Albany. No description found under this name.

*subpileatus, Polyporus.* Reported and discussed by Lloyd in Lloyd *Mycol. Notes* 64:1019. 1920. In Fries' *Epicrisis*, p. 472, this species is placed between *P.* (*Fomes*) *annosus* and *P.* (*Fomes*) *connatus.* Lloyd's comments do not apply to such a species, but rather to one like *P. semipileatus.* Dr. John Stevenson writes of the specimen in the Lloyd Herbarium "...specimen...under the name *P. subpileatus* is in the Lloyd Herbarium under that name. Lloyd used the name as it was written on the original label.... From his comments on the specimen, however, I feel sure that he confused the name with *semisupinus* as you suggest." (Note: "semipileatus" was the name the writer intended to suggest. Lloyd considered *P. semipileatus* a synonym of *P. semisupinus.*)

*Sullivantii* Mont., *Polyporus.* Reported by Peck in *N.Y.S. Mus. Rept.* 22:84. 1869. As stated by Lloyd (Lloyd *Mycol. Notes* 29:379. 1908) the Albany specimen is *P. pubescens.* Murrill (**7,** p. 19) lists *P. Sullivantii* as a synonym of *P. pubescens.*

*Valenzuelianus* Mont., *Polyporus.* Reported in Lloyd *Letter* 67:11. 1918. Not collected in the state. Dr. D. V. Baxter examined the specimen in the Lloyd Herbarium. The notes on the label within the packet read "This I think must be from the south. L. A. Zimm. Ithaca, N. Y. Col. in Louisiana" (Lloyd).

*Weinmanni* Fries, *Polyporus.* The writer would refer the collections at Albany as follows:

Bolton Landing collection = *P. fragilis*
Catskill Mts. collection = *P. mollis* (*P. Weinmanni* is a synonym of *P. mollis* according to Lloyd)
Floodwood collection = *P. ursinus*

Collection reported by Kauffman in *N.Y.S. Mus. Bull.* 179:90. 1915 now (correctly) referred to *P. ursinus* in MU herbarium.

### FAVOLUS Fries

Fruiting body annual, epixylous, more or less stipitate, the stem typically lateral; pileus fleshy-tough when fresh, brittle when dry; context white; pore mouths more or less hexagonal, often radially elongated; cystidia none; spores hyaline.

Species of Polyporus with similar pores differ in having the stem central and well developed.

The genus is represented in New York State by only one species.

#### KEY TO THE SPECIES

1. Pores 0.5 mm. or more wide; tubes not waxy when fresh; hyphae 2.5–4 $\mu$ in diameter; spores 8–11 x 3–4 $\mu$.....*99. F. alveolaris*

Pores 2–3 per mm.; tubes more or less waxy when fresh; hyphae 5–8 $\mu$ in diameter; spores 3.5–5 x 2–2.5 $\mu$.....See *59. Polyporus rhipidium*

### 99. Favolus alveolaris (DC.) Quél.

*F. canadensis* Klotzsch; *F. europaeus* Fries; *F. microporus* (Murr.) Sacc. and D. Sacc.; *Hexagona alveolaris* (DC.) Murr.; *H. micropora* Murr.; *H. striatula* (Ell. and Everh.) Murr.

*Laterally stipitate; pores angular, radially elongated, large.*

**Stem** lateral or reduced to a lateral tubercle, rarely excentric, not over 1 cm. long, 0.2–0.7 cm. thick; **pileus** fleshy-tough when fresh, drying brittle, reniform or flabelliform to circular, rarely somewhat infundibuliform, 2–5 x 2–8 x 0.2–0.8 cm.; surface at first reddish brown and innately fibrillose, becoming ochraceous to white, glabrous; margin thin to somewhat thickened, fertile below;

**context** white, firm and fragile when dry, 0.5–2 mm. thick, the hyphae somewhat branched, thick-walled, 2.5–4 $\mu$ in diameter; **tubes** decurrent, sometimes to the base of the stem, at first white to light buff, drying somewhat darker, 1–5 mm. long, mouths concolorous, angular, four to six sided, usually radially elongate, 0.5–4 mm. long, 0.5–2 mm. wide, the edges thin, often torn, dentate; cystidia none; basidia 5–8 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, straight to slightly curved, apiculate, 8–11 x 3–4 $\mu$.

On branches of hardwoods, especially of hickory, recorded on beech, hickory, and oak. Common. Spring and summer.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Hard, Mushrooms, p. 429, *f. 359.* 1908 (as *F. canadensis*); Lloyd, Polyp. Issue 2:18, *f. 256* (as *F. europaeus*), and p. 19, *f. 257* (as *F. micro(s)porus*). 1909; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:158. *pl. 1, f. 6.* 1914 (as *F. europaeus*); Shope, Ann. Missouri Bot. Gard. 18: 454. *pl. 38, f. 5.* 1931.

OBSERVATIONS

*boucheanus* Klotzsch, *Polyporus* (but authority Fries in Mus. Repts.). Reported by Peck in *N.Y.S. Mus. Rept.* 22:82. 1869 and discussed in *Rept.* 26:90. 1874. The collection was not found at Albany. Peck later referred this collection to *Favolus canadensis* (= *alveolaris*). See *Bull. Buffalo Soc. Nat. Sci.* 4:185. 1883.

**TRAMETES** Fries

Fruiting body usually annual, epixylous, sessile, effused-reflexed, or resupinate (except substipitate in *T. merisma*), corky, coriaceous, or rigid; context white, pinkish, or more or less brown; pore mouths circular to angular, sometimes daedaloid; tramal tissue continuous with the context, the tubes often sunken to uneven depths into the context; cystidia none, setae present or absent; spores hyaline.

As defined by Fries, the genus includes those species with pore mouths equal, circular to elongated, and with the substance of the trama continuous with the substance of the pileus. Other genera, however, exhibit these characters. It is often difficult to differentiate from Trametes certain species of Polyporus or of Fomes. Forms of species of Daedalea with circular pore mouths, or poroid forms of species of Lenzites, are sometimes confusing.

KEY TO THE SPECIES

1. Context pinkish to rose colored ..... *107. T. subrosea*
   Context white, whitish, or buff ..... 2
   Context light brown ..... 11
   Context yellowish brown or darker ..... 14

Context white or whitish

2. Fruiting body resupinate or nearly so ..... 3
   Fruiting body pileate ..... 5
3. Spores ovoid, 4.5–5 x 3.5–4.5 $\mu$; pores 2–4 per mm.
   See *129. Fomes annosus*
   Spores cylindric-ellipsoid, 7–9 x 2–3 (4) $\mu$; pores 2–3 per mm., *100. T. serialis*
   Spores cylindrical to cylindric-ellipsoid; pores not less than 2 per mm. ..... 4

4. Pores 1–3 mm. broad; spores 8–12 x 3.5–4.5 μ; on coniferous wood, *102. T. heteromorpha*
   Pores 1–2 per mm.; spores 8–11 x 3–4 μ; usually on deciduous wood ..... *103. T. sepium*
   Pores 1–2 per mm.; spores 6–8 x 2.5–3 μ; usually on coniferous wood ..... *101. T. variiformis*
5. Surface of the pileus distinctly brown ..... 6
   Surface of the pileus white, whitish, buff, grayish, or brownish .... 7
6. Pores 1–2 per mm.; spores cylindrical to cylindric-ellipsoid, *101. T. variiformis*
   Pores 2–3 per mm.; spores cylindric-ellipsoid ..... *100. T. serialis*
   Pores 2–4 per mm.; spores ovoid ..... See *129. F. annosus*
7. Context 1–2 mm. thick or thinner ..... 8
   Context typically 2 mm. or more thick, usually much thicker ..... 10
8. Pores 1–3 mm. broad; on the wood of coniferous trees, *102. T. heteromorpha*
   Pores 1–3 per mm.; usually on the wood of deciduous trees ..... 9
9. Pileus more or less substipitate; surface subpubescent, with sterile proliferations; pores 2–3 per mm. ..... *104. T. merisma*
   Pileus sessile or effused-reflexed; surface nearly glabrous, smooth; pores 1–2 per mm ..... *103. T. sepium*
   Pileus narrowly reflexed, sometimes entirely resupinate; surface coarsely hirsute or strigose; pores 2–3 per mm ..... *108. T. Morgani*
10. Pores 1–3 per mm.; pileus large, 3 cm. or more wide; on willow and poplar ..... *106. T. suaveolens*
    Pores 4–6 per mm.; pileus large, 3 cm. or more wide; on locust only ..... See *79. Polyporus robiniophilus*
    Pores 9–11 per mm.; pileus small, not over 2 cm. wide .... *105. T. pusilla*

Context light brown or darker

11. Surface of the pileus hirsute or strigose ..... 12
    Surface velvety to glabrous ..... 13
12. Context 1 mm. or less thick; pores 2–3 per mm.; pileus narrowly reflexed, up to 1.5 cm. wide ..... *108. T. Morgani*
    Context 2–10 mm. thick; pores about 1 per mm.; pileus 2–5 cm. wide ..... *109. T. hispida*
13. Context 2–5 mm. thick; surface light brown, darkening with age, azonate or nearly so ..... *110. T. malicola*
    Context 1 mm. or less thick; surface dark brown, distinctly zonate, *111. T. mollis*
14. Setae present ..... 15
    Setae absent ..... 16
15. Spores subglobose to globose, 4–5 μ; hyphae 3–5 μ in diameter, See *136. Fomes Pini*
    Spores cylindrical, 6–8.5 x 1.5–2 μ; hyphae 2.5–3 μ in diameter, *114. T. tenuis*
16. Context 0.5 mm. or less thick; fruiting body usually reflexed or resupinate; pores often hexagonal ..... *112. T. carbonaria*
    Context 5–15 mm. thick; pileus sessile; pores angular to elongated or daedaloid ..... *113. T. odorata*

*I. Context white, whitish, or buff.*

*A. Surface of the pileus brown.*

### 100. **Trametes serialis** Fries

*T. serialis resupinata* Romell; *Coriolellus serialis* (Fries) Murr. in part.

*Pores 2–3 per mm., circular to angular.*

**Fruiting body** effused-reflexed or often resupinate, coriaceous, laterally confluent, narrowly reflexed, 0–1 x 1–6 × 0.3-0.8 cm.;

surface brown, appressed-tomentose to nearly glabrous, zonate; margin thin to thick, acute to obtuse; **context** white, corky, less than 1 mm. thick, the hyphae rarely branched, thick-walled, 2–5 $\mu$ in diameter; **tubes** white, 2–8 mm. long, mouths white or whitish, circular to angular, 2–3 per mm., the edges thick and entire, becoming thin and dentate with age; cystidia none; basidia "5–6 $\mu$ broad" (Shope); **spores** "smooth, hyaline, cylindric-ellipsoid, 7–9 x 2–3 (4) $\mu$" (Shope).

On the wood of coniferous or rarely of deciduous trees, recorded on balsam, hemlock, pine, spruce, and white poplar. Frequent. Spring, summer, and fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Lloyd, Mycol. Notes 69: *pl. 235, f. 2393.* 1923; Shope, Ann. Missouri Bot. Gard. 18:438. *pl. 30, f. 3.* 1931; Snell, Mycologia 15:153. *pl. 16, f. 1–3.* 1923.

Type of rot: brown pocket rot, see Hubert (**2,** p. 413); Snell, Mycologia 15:158. 1923.

### 101. Trametes variiformis Peck

*Polyporus variiformis* Peck; *P. variiformis interruptus* Peck; *P. variiformis nodulosus* Peck; *P. variiformis resupinatus* Peck; *Coriolellus variiformis* (Peck) Murr. in part.

*Pores 1–2 per mm., angular to daedaloid.*

**Fruiting body** narrowly reflexed or often entirely resupinate, coriaceous, 0–1 x 1–5 x 0.2–0.6 cm.; surface brown, hirsute to nearly glabrous, zonate; margin obtuse to acute, fertile below; **context** duplex, the upper layer concolorous with the surface, lower layer white, 1 mm. or less thick, the hyphae of the lower layer rarely branched, thick-walled, 3–6 $\mu$ in diameter; **tubes** white or whitish, 1–6 mm. long, mouths concolorous, angular to daedaloid, averaging 1–2 per mm., the edges thick, becoming incised with age; cystidia none; basidia "7–9 $\mu$ broad" (Shope); **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, 6–8 x 2.5–3 $\mu$.

On the wood of coniferous trees, recorded on white pine, black spruce, spruce unclassified, and maple (doubtful). Uncommon. Summer and fall. When entirely resupinate compare *T. heteromorpha.* At times closely resembles *T. mollis,* but can be distinguished by the branching of the hyphae, the color of the context, and most easily by the color of the tubes.

SM; LM; CU; MU.

Illustrations: Lloyd, Mycol. Notes 61: *pl. 128, f. 1521–1522.* 1919, and Notes 62: *pl. 149, f. 1698.* 1920; Shope, Ann. Missouri Bot. Gard. 18:438. *pl. 30, f. 4.* 1931.

*B. Surface of pileus white, whitish, buff, or grayish (compare also 108. T. Morgani).*

**102. Trametes heteromorpha** (Fries) Lloyd

*T. hexagoniformis* (Murr.) Lloyd; *Polystictus heteromorpha* (Fries) Lloyd; *Lenzites heteromorpha* Fries; *Coriolus hexagoniformis* Murr.

*Pores 1–3 mm. broad; context 1 mm. thick; on coniferous wood.*

**Fruiting body** effused-reflexed or more often resupinate, coriaceous to firm-corky, 0–2 x 1–5 x 0.2–1 cm.; surface white to buff, tomentose, zonate; margin obtuse, fertile below; **context** white to buff, 1 mm. or less thick, the hyphae rarely branched, thick- to thin-walled, 3–5 $\mu$ in diameter; **tubes** white to buff, 0.2–1 cm. long, mouths concolorous, angular to daedaloid, 1–3 mm. broad, the edges rather thick, entire to lacerate; cystidia none; basidia 6–8 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, cylindric-ellipsoid, 8–12 x 3.5–4.5 $\mu$.

On the wood of coniferous trees, recorded on hemlock and spruce. Rare. Fall. When entirely resupinate separable from *T. variiformis* only by the size of the pores.

SM; LM.

Illustrations: Lloyd, Mycol. Notes 59:848. *f. 1415*, p. 849, *f. 1416–1419*. 1919; Shope, Ann. Missouri Bot. Gard. 18:440. *pl. 31, f. 2*. 1931.

Type of rot: brown cubical rot of coniferous wood, see Hubert (**2**, p. 416).

**103. Trametes sepium** Berk.

*Coriolellus sepium* (Berk.) Murr.

*Pores 1–2 per mm.; context 1 mm. thick; usually on deciduous wood.*

**Fruiting body** sessile or effused-reflexed, sometimes resupinate, corky, 0–1 x 1–3 x 0.2–0.7 cm.; surface white or whitish, nearly glabrous, azonate to faintly zonate; margin acute, fertile below; **context** white, 1 mm. or less thick, the hyphae rarely branched, thick-walled, 2–5 $\mu$ in diameter; **tubes** white to pallid, 2–5 mm. long, mouths concolorous, circular to slightly sinuous, averaging 1–2 per mm., the edges moderately thick, entire; cystidia none; basidia 6–8 $\mu$ in diameter; **spores** cylindrical to cylindric-ellipsoid, 8–11 x 3–4 $\mu$.

On the wood of deciduous or rarely of coniferous trees, recorded on cherry, hickory, oak, willow, red cedar, and hemlock. Rather common. Summer and fall.

Compare *T. heteromorpha*.

NYBG; SM; CU; LM.

Illustrations: Lloyd, Mycol. Notes 59:850. *f. 1420*, and *f. 1421* (as *T. minima*) 1919; Overholts, Wash. Univ. Studies 3:96. *pl. 7. f. 39, a–c*. 1915.

Type of rot: brown crumbly rot of the wood of deciduous trees. see Hubert, (**2**, p. 411).

**104. Trametes merisma** Peck

*Pores 2–3 per mm.; pileus often with abortive proliferations.*

**Fruiting body** usually very shortly substipitate, the stem-like base short, sometimes absent, pubescent, concolorous with the tubes; **pilei** erect or pendant, coriaceous, fibrous, tough, commonly deeply divided into several pileoli, 2.5–7 cm. broad, 0.2–0.4 cm. thick; surface white or whitish, subpubescent, azonate, uneven, tuberculose, colliculose, or diminutively proliferous, especially in the center, the proliferations abortive, sterile; margin obtuse, sterile below; **context** white, 1–2 mm. thick, the hyphae rarely branched, thin-walled, 4–6 $\mu$ in diameter; **tubes** white, 1 mm. or less long, mouths concolorous, circular to subcircular, averaging 2–3 per mm., the edges at first obtuse, then acute and rather thin, entire; cystidia none; basidia or spores not observed.

On the wood of deciduous trees, recorded on beech. Known only from the type collection, Fine, August, C. H. Peck. The numerous pileoli are distinctive. The type specimens are not markedly trametoid in character and they may yet be demonstrated to be abnormal specimens of a species of Polyporus. The type collection is apparently sterile.

SM.

**105. Trametes pusilla** Lloyd

*Pores 9–11 per mm.; pileus small, convex to ungulate; on hardwoods.*

**Pileus** sessile, soft-corky, dimidiate, convex to ungulate, 0.5–1.5 x 0.8–2 x 0.2–0.5 cm.; surface grayish, dull, minutely pubescent, azonate; margin rather thin, acute, sterile below; **context** white to pallid, usually duplex, a thin soft spongy layer above, within rather hard, slightly zonate, 1–4 mm. thick, the hyphae of the inner portion rarely branched, thick-walled, 3–6 $\mu$ in diameter; **tubes** white, 1 mm. or less long, mouths white to cream color or tinted with brown or reddish on drying, circular to angular, averaging 9–11 per mm.[1], the edges moderately thick, entire; cystidia none; basidia not observed; **spores** "hyaline, smooth, cylindric, 6 x 3 $\mu$" (Lloyd).

On the wood of deciduous trees, recorded only on white oak. Very rare, one collection known, Long Island, Roy Latham. The above description is based upon two specimens from Mr. Latham's collection.

SM; LM.

Illustrations: Lloyd, Mycol. Notes 54: 774. *f. 1165.* 1918.

[1] In the illustration of the type of this species (Lloyd's *Mycol. Notes* 54:774. *fig. 1165.* 1918) the pores appear somewhat larger, about 4–5 per mm.

**106. Trametes suaveolens** (L.) Fries

*Pores 1–3 per mm.; pileus large, thick, fragrant; usually on willow.*

**Pileus** sessile, coriaceous to corky, fragrant when fresh, 3–10 x 5–15 x 1–5 cm.; surface white to yellowish or grayish, villous-tomentose to glabrous, azonate; margin acute to obtuse, usually sterile below; **context** white or whitish, corky, 0.5–2.5 cm. thick, the hyphae thick-walled, variable in size, 3–12 $\mu$ in diameter, the smaller often branched, the larger rarely branched; **tubes** concolorous, sometimes stratified, 0.3–2 cm. long, mouths white to dark colored, circular to slightly angular, averaging 1–3 per mm., the edges thick, entire; cystidia none; basidia not observed; **spores** "cylindric, 8–12 x 3–4 $\mu$" (Overholts), "4.5–10 (3.5 x 8.7) 2.5–4.1 $\mu$" (Hirt).

On the wood of living or dead willows, rarely on poplar. Spring, summer, and fall. Common.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Hirt, N.Y.S. Coll. Forestry Tech. Publ. 37: *pl. 7, f. 68.* 1932; Hubert, Outl. For. Path. p. 412, *f. 128.* 1931; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:160. *pl. 2, f. 9.* 1914.

Type of rot: white heartrot of willow, see Hirt, N.Y.S. Coll. Forestry Tech. Publ. 37. 1932 (biology).

*II. Context pinkish to rose colored (compare also 49. Polyporus cinnabarinus).*

**107. Trametes subrosea** Weir

*Trametes* (*Fomes*) *carnea* (Nees) of American writers, not Cooke; *Fomes carnea subzonata* Peck; *F. carnea granularis* Peck

*Pileus thin, more or less pinkish; usually on coniferous wood.*

**Pileus** sessile or effused-reflexed, coriaceous to rigid, conchate to applanate, rarely thicker, 1–5 x 2–7 x 0.3–0.7 cm.; surface pinkish to rose colored, becoming grayish to black with age, at first velvety-tomentose, becoming radially appressed-fibrillose to nearly glabrous, sometimes scabrous with minute tufts of short erect hairs, zonate to azonate; margin thin, sterile below; **context** pinkish to rose colored, corky, indistinctly zonate, 2–5 mm. thick, the hyphae rarely branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** concolorous, white lined, 0.5–3 mm. long, mouths pinkish or rosy, circular to slightly angular, averaging 3–5 per mm., the edges moderately thick, entire; cystidia none; basidia 4–6 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, sometimes allantoid, 5–8 x 1.5–2.5 $\mu$.

On the wood of coniferous or rarely of deciduous trees, recorded on red cedar, hemlock, white pine, red spruce, spruce unclassified, beech, birch, and maple. Common. Summer and fall. The taxonomy of the species is discussed by Weir in *Rhodora* 25:214–220. 1923, and the physiology and cultural differences by Snell *et al.* in *Mycologia* 20:276–291. 1928.

NYBG; SM; CU; LM; CF.

Illustrations: Lloyd, Synop. Genus Fomes, p. 224, *f.* 577. 1915 (as *Trametes carnea*); Overholts, Wash. Univ. Studies 3:98. *pl. 8, f. 41, a–b.* 1915 (as *T. carnea*); Shope, Ann. Missouri Bot. Gard. 18:442. *pl. 32, f. 1.* 1931; Zeller, Jour. Agr. Research 33:688. *f. 1.* 1926.

Type of rot: brown rot, see Hubert (**2,** pp. 384–386); Snell, Mycologia 15:158, 159. 1923; and Zeller, Jour. Agr. Research 33:687–693. 1926.

*III. Context light brown.*

**108. Trametes Morgani** Lloyd

*Funalia rigida* (Berk. and Mont.) H. D. House in part, not *Coriolopsis rigida* (Berk. and Mont.) Murr.

*Pileus hirsute or strigose, reflexed or resupinate, thin; pores 2–3 per mm.*

**Fruiting body** effused-reflexed or resupinate, usually by far the greater part resupinate, corky, the reflexed part up to 1.5 cm. wide, 0.2–0.3 cm. thick; surface when present pale reddish or pale brownish, coarsely hirsute or strigose; margin thin, fertile below; **context** white to light brown, 1 mm. or less thick, the hyphae rarely branched, thick-walled, 3–6 $\mu$ in diameter; **tubes** concolorous with the context, 1–2 mm. long, mouths whitish to light brown, circular to angular, averaging 2–3 per mm., the edges rather thin, entire; cystidia none; basidia not observed; **spores** "12 x 6 $\mu$" (Lloyd).

On the wood of deciduous trees, recorded only on poplar. This species has been confused with *T. hispida* and with *T. rigida* Berk. and Mont. The latter is a southern species of quite different appearance, see page 101.

SM.

**109. Trametes hispida** Bagl.

*T. Peckii* Kalchbr.; *Funalia stuppea* (Berk.) Murr.; *F. rigida* (Berk. and Mont.) H. D. House in part.

*Pileus hirsute or strigose, sessile or reflexed, thick; pores 1 per mm.*

**Pileus** sessile or effused-reflexed, corky, imbricate, 2–5 x 3–10 x 0.3–2 cm.; surface yellowish brown to dark brown, densely and coarsely hirsute or strigose, azonate to zonate; margin acute to obtuse, fertile below; **context** light brown, corky, 0.2–1 cm. thick, the hyphae thick-walled, hyaline or somewhat brownish under the microscope, the darker rarely branched, 5–8 $\mu$ in diameter, the hyaline hyphae often branched, 2–4 $\mu$; **tubes** concolorous, sometimes pallid within, 2–10 mm. long, mouths grayish brown or darker, angular to irregular, averaging about 1 per mm., the edges thin to moderately thick, entire to shallow-incised; cystidia none; basidia 7–9 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 12–15 x 3.5–5 $\mu$.

On the wood of deciduous trees. Apparently rare. According to Overholts (**8,** p. 69) occurs on willows, poplars, and cottonwoods.
NYBG; SM; LM.

Illustrations: Overholts, Wash. Univ. Studies 3:98. *pl. 8, f. 44, a–b.* 1915 (as *T. Peckii*); Shope, Ann. Missouri Bot. Gard. 18:440. *pl. 31, f. 3.* 1931; Smith, Mycologia 22:222. *pl. 26.* 1930.

Type of rot: white spongy rot of deciduous trees, see Hubert (**2,** p. 411); and Smith, Mycologia 22:221–222. 1930.

**110. Trametes malicola** Berk. and Curt.

*Coriolellus malicola* (Berk. and Curt.) Murr.

*Pileus velvety to glabrous, light brown, azonate, thick, corky.*

**Fruiting body** sessile, effused-reflexed, or resupinate, corky, 0–2 x 1–5 x 0.3–1 cm.; surface light brown, in age sometimes dark gray behind, when young slightly velvety, at least in part, becoming glabrous or nearly so, azonate or faintly zonate; margin acute, sterile below; **context** light brown, corky, 2–5 mm. thick, the hyphae rarely branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** concolorous, sometimes in two or three layers, 2–5 mm. long, mouths light brown, circular to angular or sinuous, averaging 1.5–2 per mm., the edges becoming rather thin, entire; cystidia none; basidia 5–7 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, cylindrical, 7–10 x 3–4 $\mu$.

On the wood of deciduous trees and on cut timber, recorded on apple, ash, basswood, hickory, and ?poison sumach. Frequent. This species is often confused with *T. sepium*, which sometimes discolors to brownish in age, but is never as truly brownish as *T. malicola.* Number 4295, Fungi Columbiana, is considered as representative of *T. sepium.*
NYBG; SM; LM; CF; MU.

Illustrations: Overholts, Wash. Univ. Studies 3:98. *pl. 8, f. 43, a–b.* 1915.

Type of rot: brown spongy rot of the wood of deciduous trees, see Hubert (**2,** p. 411).

**111. Trametes mollis** (Sommerf.) Fries

*Antrodia mollis* (Sommerf.) Karst.; *Trametes cervina* (Pers.) Lloyd

*Pileus usually nearly glabrous, dark brown, zonate, thin, coriaceous.*

**Fruiting body** effused-reflexed or resupinate, coriaceous, 0–2 x 1–6 x 0.2–0.5 cm.; surface dark brown, velvety to nearly glabrous, zonate; margin thin to thick, acute to obtuse, sterile or fertile below; **context** 1 mm. or less thick, duplex, light brown next the tubes, separated from the darker portion above by a thin black line, the hyphae from next the tubes usually much branched, thick-walled, 1–3 $\mu$ in diameter; **tubes** concolorous or somewhat darker, 1–4 mm. long, mouths grayish to brown, subcircular to angular or

sinuous, averaging 1–3 per mm., the edges thin to rather thick, frequently incised; cystidia not observed; basidia "5–7 $\mu$ in diameter" (Shope); **spores** "hyaline, smooth, cylindric, apiculate, occasionally curved, 9–12 x 3.5–4.5 $\mu$" (Shope). "cylindric or cylindric-ellipsoid, 8–10 x 3–4 $\mu$" (Overholts).

On the wood of deciduous[1] trees, recorded on alder, yellow birch, hickory, hornbeam, and maple. Frequent. Summer and fall.

Shope (**15,** p. 367) uses the name *T. stereoides* (Fries) Bres. for this species. The writer prefers the name *T. mollis* because of the confusion which exists in Europe concerning the identity of the Friesian species. See Romell in *Arkiv för Botanik* Band 11, No. 3, pp. 23, 24. 1911 and in Lloyd *Letter* 63:14. Note 501. 1916, and Bresadola in *Atti Accad. Rovereto* III 3:92. 1897.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:162. *pl. 3, f. 14, a–b.* 1914 (as *T. stereoides*); Overholts, Wash. Univ. Studies 3:98. *pl. 8, f. 42.* 1915; Shope, Ann. Missouri Bot. Gard. 18:440. *pl. 31, f. 1.* 1931 (as *T. stereoides*).

*IV. Context yellowish brown or darker.*

**112. Trametes carbonaria** (Berk. and Curt.) Overh.

*T. Sequoiae* Copel.; *Coriolellus Sequoiae* (Copel.) Murr.; *Hexagona carbonaria* Berk. and Curt.

*Setae absent; pileus usually reflexed, small, thin; on burnt wood.*

**Fruiting body** effused-reflexed or resupinate, rarely sessile, coriaceous, more or less separable; **pileus** narrowly reflexed, or sessile and conchate, 0–1 x 1.5–8 x 0.15–0.3 cm.; surface light brown, very minutely tomentose, faintly zonate; margin obtuse, fertile below; **context** yellowish brown, soft spongy to leathery, very thin, inconspicuous, 0.5 mm. or less thick, the hyphae rarely branched, thick-walled, 2–3 $\mu$ in dameter; **tubes** concolorous, the walls whitish pruinose within, 1.5–3 mm. long, mouths grayish brown, usually more or less hexagonal, on inclined surfaces the dissepiments breaking down and the mouths becoming somewhat sinuous, averaging 2 per mm., the edges thin, entire; cystidia or setae none; basidia 5–7 $\mu$ in diameter; **spores** hyaline, smooth, allantoid, 7–9 x 2.5–3 $\mu$.

On burnt wood of coniferous trees, recorded only on hemlock. The only certain collection is CU no. 8246, Varna, on burnt wood of hemlock stump, collected by Van Hook. No specimens were found at Albany. Rare. Fall.

NYBG; CU.

[1] Kauffman's specimens recorded on coniferous logs (*N.Y.S. Mus. Bull.* 179:91. 1915) should be referred to *Trametes variiformis.*

**113. Trametes odorata** (Wulf.) Fries

*T. protracta* Fries of most American determinations; *Glocophyllum hirsutum* (Schaeff.) Murr. in part.

*Setae absent; pileus sessile, large, thick; pores 1–2 per mm.*

**Pileus** sessile, coriaceous to rigid, 2–5 x 4–15 x 0.5–2 cm.; surface yellowish brown to nearly black, sometimes grayish with age, glabrous or nearly so, zonate or sulcate; margin obtuse, sterile below; **context** yellowish brown to rusty brown, azonate to indistinctly zonate, 0.5–1.5 cm. thick, the hyphae rarely branched, rather thin-walled, 3–6 $\mu$ in diameter; **tubes** concolorous, gray within, 5–10 mm. long, mouths dark brown to pallid, angular to elongated or daedaloid, averaging 1–2 per mm., the edges becoming thin, entire; cystidia or setae none; basidia 5–8 $\mu$ in diameter; **spores** smooth, hyaline, apiculate, cylindrical to cylindric-ellipsoid, 8–12 x 2.5–5 $\mu$.

On the wood of coniferous trees, and on cut timber, recorded on pitch pine, pine unclassified, and spruce. Uncommon. Summer.

SM; LM; CF.

Illustrations: Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:160. *pl. 2, f. 10, a–c.* 1914; Shope, Ann. Missouri Bot. Gard. 18:440. *pl. 31, f. 4.* 1931.

**114. Trametes tenuis** Karst.

*Fomes tenuis* Karst.

*Setae present; pileus usually reflexed, thin; pores 2–4 per mm.*

**Fruiting body** narrowly reflexed or more often resupinate, rarely sessile, conchate to convex, coriaceous to woody, inseparable, 0–1.5 x 1–10 x 0.1–0.6 cm.; surface reddish brown, in age weathering to grayish black, velvety-tomentose or in age becoming more or less glabrous, zonate; margin usually acute, lighter colored, narrowly sterile below, when resupinate narrowly sterile and velvety-tomentose, or fertile to the margin; **context** yellowish brown to reddish brown, 0.5–1 mm. thick, the hyphae rather thin-walled, rarely branched, 2.5–3 $\mu$ in diameter; **tubes** cinnamon brown to yellowish brown, usually grayish within, 0.5–5 mm. long, mouths concolorous, circular to elongated, the dissepiments sometimes breaking down to form elongated and sinuous pores, averaging 2–4 per mm., the edges moderately thick to thin, entire; **setae** abundant, subulate, 5–8 $\mu$ in diameter, projecting up to 40 $\mu$; basidia 3.5–4 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 6–8.5 x 1.5–2 $\mu$.

On the wood of coniferous and deciduous trees. Summer and fall, or sometimes persisting. Specimens under the name of *Poria viticola* (Schw.) Cooke must be carefully studied before accurate distribution records can be given.

Overholts (*Mycologia* 23:128. 1931) lists *Poria viticola, Trametes setosus* Weir, and *Poria superficialis* (Schw.) Cooke as synonyms of *T. tenuis.* Bresadola (*Ann. Mycol.* 18:62. 1920), Bourdot and

Galzin (**1**, p. 622) and Shope (**15**, p. 363) list *T. (Fomes) tenuis* as a synonym of *T. (Phellinus) isabellina* Fries. The writer has seen no authentic specimens of the latter species.

Illustrations: Shope, Ann. Missouri Bot. Gard. 18:438. *pl. 30, f. 1–2.* 1931 (as *T. isabellina*).

OBSERVATIONS

*callosa* (Fries) Sacc., *Poria.* Generally considered to be the resupinate form of *T. serialis.*

*hydnoides* Fries, *Trametes.* Twice reported by Peck, but no specimens found at Albany. A tropical species easily recognized by its applanate habit, brown color throughout, and the thick covering of rigid branched fibers on the surface.

*quercina* Lloyd, *Trametes.* Lloyd *Mycol. Notes* 64:1019. 1920. Specimen collected in Michigan. Described in Lloyd *Mycol. Notes* 66:1114. 1922.

*rigida* Berk. and Mont., *Trametes.* This species has been confused with *T. Morgani* and with *T. hispida.* No New York State collections have been seen which correspond to the specimens referred to *T. rigida* Berk. and Mont. in the herbarium of the New York Botanical Garden, identified by Dr. Murrill. *T. rigida* is quite distinct from *T. Morgani* or *T. hispida* as the upper surface is covered with fine, *soft, closely appressed* fibrils.

*serpens* Fries, *Trametes.* Collections at Albany do not have hyphal pegs, the outstanding character of the species (see Overholts, **11**, p. 1702). Probably resupinate specimens of other species of Trametes (Indian Lake and Kirkville specimens—*T. variiformis*?; Osceola specimen—*T. serialis*?).

Lloyd (*Mycol. Notes* 59:851 and *figs. 1422–1424.* 1919) comments on this species, "In the north, . . . . , it forms little patches." The writer has examined two specimens so determined by Lloyd (CF, col. L. H. Pennington, see Lloyd *Mycol. Notes* 64:1019. 1920; Univ. of Mich. herb. col. A. H. Povah, Vermilion, Mich. "Of American mycology, but doubtful whether that of Europe. Lloyd." Det. J. R. Weir as "*Poria papyracea* (Schw.) Cooke, see *Phytopathology* 13:187. 1923). These specimens agree exactly with a specimen determined as *Poria papyracea* by Dr. L. O. Overholts. It seems probable, therefore, that Lloyd's comments on specimens collected in the northern United States apply to *Poria papyracea.* The two species present almost exactly the same external appearance; they differ thus:

| *Poria papyracea* | *Trametes serpens* |
|---|---|
| Spores slightly roughened, sometimes appearing longitudinally striate | Spores reported to be smooth |
| Hyphal pegs absent | Hyphal pegs easily visible with a 14x handlens |

*Stephensii* Berk. and Broome, *Trametes (Polyporus).* Said to be a synonym of *T. serpens,* which see.

*Trogii* Berk., *Trametes.* Peck's determinations here included under *T. Morgani* and *T. hispida.*

**DAEDALEA** (Pers.) Fries

Fruiting body annual or persisting for two or three years, epixylous, sessile or effused-reflexed, coriaceous, corky, or rigid; context white to light brown; trama continuous with or at least not sharply distinct from the context; hymenial configuration typically daedaloid, varying to lamellate or irpiciform, or pore mouths circular; cystidia none; spores hyaline.

The daedaloid pore surface is the distinguishing character of the genus. The species are very variable. Poroid forms may easily be confused with Trametes, lamellate forms with Lenzites, or *D. unicolor* with the thin coriaceous species of Polyporus.

KEY TO THE SPECIES

1. Pores 1 per mm. or larger, the edges thick and obtuse; pilei usually large and thick ..... 2
   Pores usually smaller, or if 1 mm. or more broad, the edges thin and acute; pilei thin ..... 3
2. Growing on the wood of various deciduous trees, especially oak, *115. D. quercina*
   Growing only on the wood of red cedar ..... *116. D. juniperina*
3. Surface of the pileus villous or hirsute ..... *119. D. unicolor*
   Surface glabrous or nearly so ..... 4
4. Context white; pores 2–3 per mm.; hyphae 3–5 $\mu$ in diameter, *118. D. ambigua*
   Context whitish to light brown; pores 0.5–1.5 mm. broad; hyphae 4–8 $\mu$ in diameter ..... *117. D. confragosa*

### 115. **Daedalea quercina** (L.) Fries

*Pores large, the edges thick, obtuse; on deciduous wood.*

**Pileus** sessile, corky, convex, 3-10 x 4–15 x 2–5 cm.; surface white or grayish to almost black, glabrous, azonate; margin usually thick and obtuse, sterile or fertile below; **context** pallid to light brown, corky, zonate, 0.5–2 cm. thick, the hyphae rarely branched, thick-walled, 3–6 $\mu$ in diameter; **tubes** concolorous, 1–3 cm. long, usually whitish within, mouths whitish to dark brown, daedaloid or lamellate, 1 mm. or more broad, the edges thick, obtuse; cystidia none; basidia not observed; **spores** "cylindric, smooth, hyaline, 5–6 x 2–3 $\mu$" (Overholts).

On old logs and stumps of deciduous trees, rarely on cut timber, recorded on beech, butternut, wild black cherry, chestnut oak, white oak, oak unclassified, and on black walnut. Common. Summer and fall.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Hard, Mushrooms, p. 428, *f. 357.* 1908; Marshall, Mushroom Book, p. 114. 1905; Meinecke, Man. Forest Tree Dis. *pl. 2.* 1914; von Schrenk and Spaulding, U. S. Dept. Agr. Bur. Plant Indus. Bull. 149: *pl. 10, f. 1.* 1909.

Type of rot: white rot of the heartwood of oaks and chestnut, see Hubert, (**2,** p. 413); and von Schrenk and Spaulding, (**13,** p. 61).

### 116. **Daedalea juniperina** Murr.

*Pores large, the edges thick, obtuse; on red cedar.*

**Pileus** sessile, corky to rigid, often imbricate, ungulate, 2–7 x 2–8 x 1–3 cm.; surface whitish to grayish, or blackish at the base, finely tomentose to glabrous, azonate; margin rather thick, fertile below; **context** white to pallid, punky to soft-corky, 0.5 1 cm. thick, the hyphae rarely branched, usually thick-walled, 3-6 $\mu$ in diameter; **tubes** concolorous with the context, 0.5 2 cm. long,

mouths usually becoming more or less lamellate, 1 mm. or more broad, the edges usually thick and obtuse, sometimes becoming thin; cystidia none; basidia not observed; **spores** "cylindric, smooth, hyaline, 6–8 x 2.5–3.5 $\mu$" (Overholts).

On the wood of red cedar. Very rare, one collection only recorded, W. H. Ballou. The species is very close to *D. quercina*, differing chiefly in its substratum.

LM.

**117. Daedalea confragosa** (Bolt.) Fries

*Trametes rubescens* (Alb. and Schw.) Fries

*Pores large, often radially elongated, the edges becoming thin; context whitish to light brown; pileus zonate.*

**Pileus** sessile, leathery to rigid, usually applanate, 2–10 x 3–15 x 0.3–2 cm.; surface grayish to brownish, glabrous or nearly so, zonate; margin thin, fertile below; **context** whitish to light brown, floccose to corky, 0.2–1 cm. thick, the hyphae rarely branched, thick-walled, 4–8 $\mu$ in diameter; **tubes** somewhat lighter colored than the context, 0.1–1.5 cm. long, mouths whitish, cinereous, or flesh colored, darker where bruised, subcircular to daedaloid or radially elongated, sometimes becoming lamellate in old specimens, 0.5–1.5 mm. broad, the edges becoming thin, entire to dentate or becoming incised; cystidia none but hyaline or slightly colored branched paraphyses abundant, projecting between and beyond the basidia, 2.5–4 $\mu$ in diameter; basidia not observed; **spores** "cylindric or allantoid, smooth, hyaline, 6–7.5 x 1.5–2 $\mu$" (Overholts).

On the wood of deciduous or rarely of coniferous trees, or on living trees, recorded on smooth alder, apple, white ash, beech, gray birch, paper birch, yellow birch, birch unclassified, butternut, American elm, black gum, hornbeam, red maple, red oak, sassafras, willow, and hemlock. Common. Summer and fall. A very variable species with many confusing forms.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hard, Mushrooms, p. 422, *f. 351*, and p. 423, *f. 352* (as *Trametes rubescens*), also p. 429, *f. 358*. 1908; Lloyd, Mycol. Notes 72: *pl. 285, f. 2792*. 1924; Moffatt, Bull. Nat. Hist. Surv. Chicago Acad. Sci. 7, I: *pl. 18*. 1909; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:162. *pl. 3, f. 12, a–g*. 1914; White, Connecticut Geol. and Nat. Hist. Surv. Bull. 3:62. *pl. 34*, 1905.

Type of rot: white mottled rot of deciduous wood, see Hubert, (**2**, p. 413).

**118. Daedalea ambigua** Berk.

*D. Aesculi* (Schw.) Murr.; *D. glaberrima* Berk. and Curt.

*Pores small, circular to daedaloid; context white; pileus azonate.*

**Pileus** sessile though sometimes appearing substipitate or tuberculate-sessile, corky to rigid, applanate, 5–12 x 5–20 x 0.5–1.5 cm.;

surface white, sometimes darkening at the base, glabrous or nearly so, azonate or nearly so; margin thin, narrowly sterile below; **context** white, floccose-punky to corky, 0.2–1 cm. thick, the hyphae thick-walled, of two kinds, some rarely branched, 4–5 $\mu$ in diameter, others much branched, 3–4 $\mu$; **tubes** concolorous, 2–4 mm. long, mouths white to yellowish, circular to daedaloid, averaging 2–3 per mm., the edges thick, entire; cystidia none; "branched paraphyses sometimes present" (Overholts); basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 5–6 x 2.5 $\mu$.

On the wood of deciduous trees. Rare, one collection known, April, New Bern, H. D. House. The above spore measurements may not represent the maximum size or variation attained by this species, as only a few attached spores were seen. The spores are cylindrical rather than globose, 2–3 $\mu$, as is stated by Murrill (*No. Amer. Flora* 9:126. 1908).

SM.

Illustrations: Hard, Mushrooms, p. 427, *f. 355–356*. 1908.

### 119. **Daedalea unicolor** (Bull.) Fries

*D. unicolor* var. *fumosa* Peck; *D. ochracea* sense of Lloyd; *Cerrena unicolor* (Bull.) Murr.

*Pores 2 per mm., the edges splitting, forming teeth; pileus villous or hirsute, thin, coriaceous.*

**Pileus** sessile or effused-reflexed, coriaceous, 0.5–5 x 2–10 x 0.2–0.5 cm.; surface white to grayish or brownish, villous or hirsute, zonate; margin thin, sterile below; **context** white to pallid, corky, 1 mm. or less thick, the hyphae rarely branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** concolorous with the context or more often darkening, 1–4 mm. long, mouths white to cinereous or dark brown, daedaloid at first, soon breaking up into teeth, but remaining daedaloid at the margin, averaging 2 per mm.; cystidia none; basidia 4–5 $\mu$ in diameter; **spores** hyaline, smooth, cylindric-ellipsoid to ellipsoid, 5–6 x 2.5–3.5 $\mu$.

On the wood of deciduous or rarely of coniferous trees, recorded on beech, yellow birch, birch unclassified, fire cherry, elm, hickory, silver maple, oak, sycamore, willow, and balsam. Common. Spring, summer, and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Moffatt, Bull. Nat. Hist. Surv. Chicago Acad. Sci. 7, 1: *pl. 17, f. 2*. 1909; Murrill, Mycologia 10:107. *pl. 6, f. 6*. 1918; Overholts, Wash. Univ. Studies 3:98. *pl. 8, f. 45, a–b*. 1915.

OBSERVATIONS

*albida* Fries, *Lenzites*. Reported in *Torreya* 21:10. 1921. Here a form of *D. confragosa*.

*bicolor* Fries, *Lenzites*. Specimen at Buffalo (BM) so referred is *D. confragosa*.

*cinerea* Fries, *Daedalea*. Reported by Peck in *N.Y.S. Mus. Rept.* 22:84. 1869. Specimens at Albany are *D. unicolor*.

*concolor*, *Daedalea*. CU no. 5498. Weathered specimens of *D. unicolor*, at least in part.

*confragosa, Lenzites.* Reported in Lloyd *Mycol. Notes* 65:1077. 1921. Dr. John Stevenson writes of this in the Lloyd Herbarium "the ...specimen... is in the herbarium under the Lenzites name, but with a note to the effect that it is merely a lenzitoid form of *Daedalea confragosa.*"

*confragosa, Trametes.* Reported in Lloyd *Mycol. Notes* 67:1161. 1922 and in Lloyd *Letter* 30:1. 1911. Dr. John Stevenson writes from the Lloyd Herbarium "...the Ames specimen listed by you is not found in the herbarium but on other specimens referred to this species Lloyd notes that "it is only a trametoid form of *Daedalea confragosa.*"

*Cratacgi* Berk., *Lenzites.* Specimens so referred are *D. confragosa.* Listed as a synonym of *D. confragosa* by Murrill (**7,** p. 126).

*extensa* Peck, *Daedalea.* Described by Peck in *N.Y.S. Mus. Rept.* 44:133 (21). 1892. The original description follows: "Resupinate, thick, coriaceous, often uneven or somewhat nodulose, the margin at first cottony and white, soon changing to brown, the subiculum slightly rufescent; pores large, unequal and labyrinthiform, in vertical places oblique, whitish; spores minute, oblong, .00024 to .0003 in. long, .0001 to .00012 broad.[1]

"Prostrate trunks of deciduous trees. Salamanca. September.

"This forms patches two feet or more in length on the sides and lower surface of the trunk. It follows the inequalities of the surface, and in vertical places it becomes more or less nodulose or develops a thick obtuse margin, which is velvety-tomentose and at length dark-brown in color, but I have seen no reflexed margin. It is suggestive of resupinate forms of *Trametes mollis* but differs from it in the character of the pores, in the thicker subiculum, and in the absence of any free margin."

Overholts (**10,** p. 77) writes "It is quite probable that the species will never be recognized from the above (i.e. Peck's) description alone. The description reads somewhat like one of the resupinate forms of *Trametes serialis* Fries, in which the hymenium had become lacerated and torn. The writer has seen from one of the New England States (New Hampshire) specimens of *Trametes mollis* B. & C. that would also answer the description fairly well."

The type collection at Albany consists of two or three small pieces. The hymenial surface is now a cinnamon brown and the pores are hardly evident, their presence perhaps suggested by projections of the tissue around grass stems and other foreign material. The subiculum is nearly concolorous with the hymenial surface, is 0.5–1.5 mm. thick, and the hyphae are thick-walled, somewhat branched, 6–10.5 $\mu$ in diameter. Cystidia, basidia, or spores were not observed.

Murrill (*Mycologia* 12:110–111. 1920) reports an Indiana collection which corresponds to Peck's description.

The writer has examined a specimen in the herbarium of Dr. D. V. Baxter. It was determined by Dr. J. R. Weir who states that it is the same as Murrill's plant. Dr. Baxter's specimen agrees in general with Peck's description. A description of Dr. Baxter's specimen follows:

Fruiting body resupinate but with abortively formed pilei which are brownish and almost glabrous on the upper surface, effused up to 5 cm. in extent, coriaceous, apparently inseparable; subiculum very light brown, corky, about 1 mm. thick, the hyphae often branched, thick-walled, up to 8 $\mu$ in diameter, sometimes more; tubes ochraceous to light brown, up to 4 mm. long, mouths 1–1.5 per mm., the dissepiments thin, incised, and the pore surface appearing irregularly toothed; cystidia not observed; basida 6 $\mu$ broad; spores hyaline, smooth, apiculate, cylindrical, 7.5–9 x 2.5 $\mu$.

*Klotzschii* Berk., *Lenzites.* Albany specimen is *D. confragosa.* Listed as a synonym of *D. confragosa* by Murrill (**7,** p. 126).

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[1]Expressed in microns 6–7.5 x 2.5–3 $\mu$.

*ochracea, Daedalea,* and form *albida.* Lloyd's name for the light colored forms of *D. unicolor.*

*plumbea* Lév., *Daedalea. Ann. Sci. Nat. Bot.* III 5:302. 1846. Based on a collection from Long Island. Listed by Murrill (**7,** p. 125) as a doubtful synonym of *D. quercina.* The description is inadequate to certainly place the species.

*sulphurella* Peck, *Daedalea. N.Y.S. Mus. Rept.* 44:133 (21). 1892. According to Overholts who has worked over what remains of the type material the affinities of this species appear to be with the Hydnaceae rather than with the Polyporaceae. See Overholts' redescription (**10,** pp. 118–120).

*tricolor, Lenzites.* Specimen in BM (no. 44452) is *D. confragosa.*

### LENZITES Fries

Fruiting body usually annual, epixylous, sessile, or effused-reflexed, coriaceous to rigid; context white or brown; substance of the trama continuous with the context; hymenial configuration usually lamellate, if poroid, the pores usually radially elongated, or often daedaloid; cystidia present or absent; spores hyaline.

The genus is distinguished from Daedalea by the more lamellate pore surface, but every intermediate or even typically daedaloid pore surfaces will be encountered. The lamellate condition of this genus connects the family Polyporaceae with the family Agaricaceae.

#### KEY TO THE SPECIES

1. Context white; surface of the pileus tomentose or velvety..*120. L. betulina*
   Context whitish to light brown; surface glabrous or nearly so, See *117. Daedalea confragosa*
   Context distinctly brown..... 2
2. Surface grayish brown to cinnamon brown; mouths of the tubes circular to elongated, often radially elongated, the edges thin from the first .....*121. L. trabea*
   Surface yellowish red to reddish brown; pore surface usually lamellate, edges at first thick, becoming thin.....*122. L. sacpiaria*

### 120. Lenzites betulina (L.) Fries

*L. betulina radiata* Peck; *L. betulina rufozonata* Peck

*Context white; pileus usually tomentose or velvety, zonate.*

**Pileus** sessile or effused-reflexed, leathery to rigid, 2–5 x 2 9 x 0.3–1 cm.; surface grayish to brownish, zonate, sometimes with multicolored zones, tomentose or velvety, or subglabrous, sometimes radiate-striate; margin thin and acute, fertile below; **context** white, fleshy-tough when fresh, corky when dry, 0.5–1.5 mm. thick, the hyphae rarely to much branched, thick-walled, 2.5–8 $\mu$ in diameter, the larger (4–8 $\mu$) rarely branched; rarely poroid, usually lamellate, the **lamellae** white or whitish, about 1 mm. apart, 0.3–1 cm. broad, the edges becoming thin, entire to very minutely serrulate or lacerate; cystidia none, or "present as hyaline, sharp-pointed or blunt hairs, 24–40 x 4–5 $\mu$, projecting

10–20 $\mu$" (Overholts); basidia not observed; **spores** hyaline, smooth, cylindrical to slightly curved, 4.5–7.5 x 1–2.5 $\mu$.

On the wood of deciduous or rarely of coniferous trees, recorded on speckled alder, basswood, beech, sweet birch, yellow birch, birch unclassified, sugar maple, maple unclassified, post oak, oak unclassified, hemlock, and pine. Common. Summer and fall.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Hard, Mushrooms, p. 230, *pl. 27, f. 184*, and p. 231, *f. 185*. 1908; Lloyd, Photographs, *Issue No. 11*, and in Mycol. Notes 74: *pl. 325, f. 3114*. 1925; Marshall, Mushroom Book, p. 113. 1905.

Type of rot: brown cubical rot of the wood of deciduous trees, see Hubert, (**2,** p. 416).

### 121. **Lenzites trabea** (Pers.) Fries

*L. vialis* Peck; *Gloeophyllum trabeum* (Pers.) Murr.

*Context cinnamon brown; dissepiments thin from the first; usually on deciduous wood.*

**Pileus** sessile or effused-reflexed, coriaceous, 1–4 x 2–7 x 0.2–0.8 cm.; surface grayish brown to cinnamon brown, tomentose to glabrous, smooth to tuberculate, azonate; margin thick to thin, sterile or fertile below; **context** cinnamon brown, floccose-fibrous to soft-corky, usually becoming duplex, lighter colored and firmer next the tubes, 1–4 mm. thick, the hyphae of two kinds: brown, thick-walled, rarely branched strand hyphae 3–6 $\mu$ in diameter, and hyaline, usually thick-walled, rarely to occasionally branched binding hyphae 2–3 $\mu$ in diameter; tubes or **lamellae** concolorous with the context or appearing somewhat lighter colored, often grayish within, 1–3 mm. long, mouths cinnamon brown or darker, circular to elongated, usually radially elongated but rarely becoming truly lamellate, 1–3 per mm. in the transverse direction, the edges thin from the first, entire to dentate or lacerate; cystidia none; basidia 5–6 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical to cylindric-ellipsoid, 6–8 x 3–4 $\mu$.

On the wood of deciduous and coniferous trees, sometimes on cut timber, recorded on speckled alder, apple, ash, large toothed aspen, yellow birch, birch unclassified, oak, ?willow, hemlock, pine, and spruce. Frequent.

NYBG; SM; CU; LM; CF; BM.

Illustrations: Overholts, Wash. Univ. Studies 3:98. *pl. 8, f. 46, a–b*. 1915 (as *L. vialis*); Shope, Ann. Missouri Bot. Gard. 18:454. *pl. 38, f. 1*. 1931.

Type of rot: brown cubical rot of deciduous and coniferous wood, see Hubert (**2,** p. 416); and Snell, Mycologia 15:156, 157. 1923.

**122. Lenzites saepiaria** (Wulf.) Fries

*L. sepiaria porosa* Peck; *Glocophyllum hirsutum* (Schaeff.) Murr. in part.

*Context yellowish brown to reddish brown; dissepiments at first thick; usually on coniferous wood.*

**Pileus** sessile or effused-reflexed, coriaceous to rigid, 1–6 x 2–7 x 0.3–1 cm.; surface yellowish red to dark reddish brown, grayish black on weathering, strigose-tomentose or velvety to nearly glabrous, zonate; margin at first obtuse, becoming acute, fertile below; **context** yellowish brown to reddish brown, corky, 1–3 mm. thick, the hyphae rarely branched, thick-walled, 4–6 $\mu$ in diameter; below sometimes daedaloid or poroid, usually lamellate, the **lamellae** light to dark brown, 1–2 per mm. in transverse direction, 2–5 mm. broad, the edges at first thick, entire, becoming thin and dentate-lacerate; **cystidia** inconspicuous, usually capitately incrusted, 4–5 $\mu$ in diameter, projecting up to 10 $\mu$; basidia 4.5–5.5 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, cylindrical, 8–10 x 3–4 $\mu$.

On the wood of coniferous or rarely of deciduous trees, recorded on balsam, hemlock, white pine, spruce, yellow birch, fire cherry, sweet cherry, cottonwood, black willow, and glaucous willow. Common.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Overholts, Wash. Univ. Studies 3:98. *pl. 8, f. 47, a–b.* 1915; Shope, Ann. Missouri Bot. Gard. 18:452. *pl. 37, f. 1.* 1931; Spaulding, U. S. Dept. Agr. Bur. Plant Indus. Bull. 214:22. *f. 2,* and *pl. 1,* also *pl. 3, f. 3.* 1911.

Type of rot: brown saprot, see Hubert (**2,** pp. 413–416); Snell, Mycologia 15:155, 156. 1923; Spaulding, U. S. Dept. Agr. Bur. Plant Indus. Bull. 214. 1911, and U. S. Dept. Agr. Tech. Bull. 132. 1929.

OBSERVATIONS

*abietina* Fries, *Lenzites.* A species closely related to *L. saepiaria,* differing chiefly in the presence of ventricose cystidia. Reported by Peck in *N.Y.S. Mus. Rept.* 41:56. 1888. Not found at Albany. Specimens so referred at Ithaca are *L. saepiaria.*

*flaccida* (Bull.) Fries, *Lenzites.* Specimens at Albany and Ithaca are *L. betulina.* Listed as a synonym of *L. betulina* by Murrill (**7,** p. 127).

*protracta, Lenzites.* Name used by Lloyd, probably for the lenzitoid form of *Trametes protracta* (*T. odorata*).

*striata* Sw., *Lenzites.* Reported by Peck in *N.Y.S. Mus. Rept.* 27:89. 1875, and in *Rept.* 41:56. 1888. Not found at Albany.

*trabea* (Pers.), *Trametes.* Poroid form of *L. trabea.*

*velutina, Lenzites.* Reported in Lloyd *Letter* 39:2. 1912. A form of *L. betulina.*

**CYCLOMYCES** Kunze and Fries

Fruiting body annual, terrestrial, stipitate in our species; pileus coriaceous; context brown; pore surface typically concentrically lamellate; cystidia or setae none; spores brown.

The genus is represented in New York State by one species.

### 123. Cyclomyces Greenei Berk.

*Cycloporus Greenei* (Berk.) Murr.

*Pileus stipitate, brown; lamellae concentric; spores brown.*

**Stem** central, velvety, yellowish brown to rusty brown, 2–7 cm. long, 0.7–2 cm. thick; **pileus** coriaceous, circular, usually depressed, 3–10 cm. broad, 0.5–2 cm. thick; surface yellowish brown to rusty brown or purplish brown, at first tomentose, becoming glabrous, more or less zonate; margin obtuse, below the lamellae shortening toward the margin and the extreme margin sterile; **context** yellowish brown to cinnamon brown, spongy fibrous to firm fibrous, somewhat zonate, 5–10 mm. thick, the hyphae rarely branched, thin-walled, 7–11 $\mu$ in diameter; lamellate or very rarely poroid, the **lamellae** concentrically arranged, brown, up to 8 mm. broad, the edges thin, uneven, splitting with age; setae or cystidia none; basidia not observed; **spores** pale reddish brown under the microscope, smooth, ovoid, 10–14 x 5–6 $\mu$.

On soil. Rare. Summer and fall.

NYBG; SM; LM; CU.

Illustrations: Hard, Mushrooms, p. 430, *f. 360*, p. 431, *f. 361*. 1908; Icones Farlowianae, p. 103, *pl. 95*. 1929; Lloyd, Mycol. Notes 36: 488, *f. 380*, and p. 489, *f. 382*. 1910, Mycol. Notes 45: 633, *f. 902*. 1917.

**FOMES** (Fries) Gill.

Fruiting body typically perennial, epixylous, sessile, sometimes resupinate, corky or more often woody; context white to light or dark brown, or reddish; pore mouths circular, angular, or daedaloid; yearly growth usually taking place by the addition of a new layer of tubes just below the layer of the previous year, the tubes continuous or separated by a thin layer of context, hence the tubes more or less stratified; cystidia or setae present or absent; spores hyaline or brown.

The perennial habit as shown by the stratified tubes is the distinguishing character of the genus. The usually woody texture of the pileus is an important supplementary character. Certain species of Polyporus, of Daedalea, or of Trametes occasionally persist for two or three years, but are never typically perennial, and will rarely cause confusion.

KEY TO THE SPECIES

1. Context white to light brown ..... 2
   Context flesh color to pinkish or rose colored ..... 7
   Context yellowish brown or darker ..... 8

Context white to light brown

2. Fruiting body small, up to about 2.5 cm. broad ..... 3
   Fruiting body usually much larger, more than 2.5 cm. broad ..... 4
3. Surface of the pileus becoming entirely dark brown or black; spores cylindrical; usually on alder ..... *124. F. scutellatus*
   Surface remaining light colored at the margin; spores ovoid with a truncate apex; on various kinds of wood ..... *125. F. ohiensis*
4. Growing on the wood of coniferous trees ..... 5
   Growing on the wood of deciduous trees ..... 6
5. Pileus resupinate to sessile, usually more or less applanate, not more than 3 cm. thick; context corky, whitish ..... *129. F. annosus*
   Pileus convex to ungulate, 3–10 cm. thick; context corky to woody, pallid to light brown ..... *128. F. pinicola*
   Pileus ungulate, 5–30 cm. thick; context friable when dry, white or whitish ..... *130. F. officinalis*
6. Surface of the pileus usually white or yellowish, never rimose; cystidia and cystidia-like bodies present in the hymenium; context soft-corky to firm, white or whitish ..... *127. F. connatus*
   Surface becoming grayish to black, usually more or less smooth; hair-like cystidia present; context corky to woody, pallid to light brown; pores 3–5 per mm ..... *128. F. pinicola*
   Surface becoming grayish black or black, somewhat rimose with age; cystidia absent; context woody; pores 2–3 per mm., *126. F. fraxinophilus*

Context more or less pink

7. Pileus plane to convex, usually light colored with reddish spots, or altogether reddish; spores ovoid to subglobose; on deciduous wood ..... *131. F. fraxinicus*
   Pileus usually ungulate, pinkish, often black with age; spores cylindrical; on coniferous wood ..... *132. F. roscus*
   Pileus usually conchate to applanate, pinkish or becoming grayish to black with age; spores cylindrical, sometimes allantoid; on coniferous or rarely on deciduous wood ... See *107. Trametes subrosea*

Context yellowish brown or darker

8. Setae present, though sometimes scarce ..... 9
   Setae absent ..... 14
9. Pileus usually thin and conchate, or fruiting body resupinate ..... 10
   Pileus plane to convex or ungulate ..... 11
10. Pores 1–4 per mm.; hyphae 3–5 $\mu$ in diameter; on coniferous wood, *136. F. Pini*
    Pores 4–7 per mm.; hyphae 2–3 $\mu$ in diameter; on deciduous wood, *135. F. conchatus*
    Pores 4–5 per mm.; hyphae 3–4 $\mu$ in diameter; on deciduous wood, *133a. F. igniarius* var. *laevigatus*
11. Growing only on the wood of coniferous trees ..... *136. F. Pini*
    Growing only on the wood of deciduous trees ..... 12
12. Spores brown; usually on oak ..... *140. F. Everhartii*
    Spores hyaline ..... 13
13. Growing only on the wood of pomaceous hosts; pileus small, 0–3 cm. broad ..... *134. F. pomaceus*
    Growing on a wide variety of hosts; pileus larger, 3–10 cm. broad, *133. F. igniarius*

14. Context woody, bright shining yellowish brown..... 15
Context soft and punky, or spongy to soft corky, at least above, dull yellowish brown to dark brown..... 16
15. Pileus soon rimose; spores brown; growing only on locust, *141. F. rimosus*
Pileus smooth or cracking somewhat in age but scarcely rimose; spores hyaline; on various kinds of wood.....*138. F. robustus*
16. Pileus in age becoming slightly incrusted; context duplex; growing at the base of Ribes plants.....*139. F. Ribis*
Pileus distinctly incrusted; context homogeneous..... 17
17. Pileus convex to ungulate; spores hyaline.....*137. F. fomentarius*
Pileus plane to convex..... 18
18. Fruiting body reviving and a new pileus growing out below the one of the previous year; crust thin; spores 8–11 x 5–7 $\mu$..*142. F. lobatus*
Fruiting body truly perennial, the tubes growing out immediately below those of the previous year in the same pileus; crust thin or more often thick; spores 5–7 x 4–5 $\mu$.....*143. F. applanatus*

*I. Context white to light brown.*

*A. Fruiting body small, not over 2.5 cm. broad.*

**124. Fomes scutellatus** (Schw.) Cooke

*Polyporus scutellatus* Schw.; *Trametes scutellatus* (Schw.) Morg.

*Spores cylindrical; pileus becoming entirely dark; on alder.*

**Pileus** sessile or sometimes attached by the vertex and circular in outline, rarely resupinate, corky to woody, usually convex to ungulate, 0.5–1.5 x 0.5–2 x 0.2–0.5 cm.; surface entirely dark brown or black, at least when mature, velvety, becoming almost glabrous, azonate, somewhat concentrically sulcate; margin rather thick, acute, fertile below; **context** white to light brown, corky, 2 mm. or less thick, the hyphae somewhat branched, thick-walled, 2–4 $\mu$ in diameter; **tubes** concolorous, indistinctly stratified, 1–2 mm. long each season, mouths white to pallid, circular to subcircular, averaging 4–5 per mm., the edges at first thick and obtuse, becoming rather thin, entire; cystidia none; hyphal pegs hyaline to brownish, 25–40 $\mu$ in diameter, projecting up to 40 $\mu$; basidia 6–9 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 8–9 x 2.5–3.5 $\mu$.

On very rotten wood of speckled alder, alder unclassified, and witch hazel. Common.

NYBG; SM; LM; CU; CF; MU.

Illustrations: Overholts, Ann. Missouri Bot. Gard. 2:730. *pl. 25, f. 24.* 1915.

**125. Fomes ohiensis** (Berk.) Murr.

*Trametes ohiensis* Berk.

*Spores ovoid, truncate at apex; pileus margin remaining white.*

**Pileus** sessile or sometimes attached by the vertex and circular in outline, rarely resupinate, corky when fresh, woody when dry, convex to ungulate, 0.5–2.5 x 0.5–3 x 0.2–1 cm.; surface at first pure white, becoming black at the base but the margin remaining

white, finely tomentose to glabrous, often zonate or concentrically sulcate; margin rather thick, acute to obtuse, fertile below; **context** white to light brown, corky, 1–3 mm. thick, the hyphae rarely branched, thick-walled, 3–4 $\mu$ in diameter; **tubes** concolorous, indistinctly stratified, 1–5 mm. long each season, the mouths white, circular, averaging 3–5 per mm., the edges remaining rather thick, at least half as thick as the width of the pore, entire; cystidia none; basidia "8–11 $\mu$ broad" (Overholts); **spores** usually present, hyaline, smooth, ovoid with a truncate apex, 10–12 x 6–8 $\mu$.

On the wood of deciduous trees, and on cut timber, recorded on beech, mountain maple, sugar maple, and on chestnut fence rails. Occasional.

NYBG; SM; LM; CF; MU.

Illustrations: Coker, Jour. Elisha Mitchell Soc. 43: 144. *pl. 14.* 1927 (as Ganoderma); Overholts, Ann. Missouri Bot. Gard. 2: 730. *pl. 25. f. 22.* 1915.

*B. Fruiting body usually much larger, more than 2.5 cm. broad.*

*1. On the wood of deciduous trees.*

**126. Fomes fraxinophilus** (Peck) Sacc.

*Polyporus fraxinophilus* Peck

*Spores 6–8 x 5–6 $\mu$; cystidia none; pores 2–3 per mm.*

**Pileus** sessile, woody, convex to somewhat ungulate, 5–20 x 5–30 x 3–10 cm.; surface at first white, soon grayish black to black, velvety, soon glabrous, somewhat rimose with age, sulcate; margin often remaining light colored, thick, obtuse to acute, usually fertile below; **context** white to light brown, woody, 0.5–1.5 cm. thick, the hyphae rarely branched, rather thick-walled, 3–5 $\mu$ in diameter; **tubes** concolorous except the latest growth which is usually lighter in color, white stuffed, indistinctly stratified, 2–4 mm. long each season, mouths white to brownish, circular to angular, averaging 2–3 per mm., the edges thick, entire; cystidia none; basidia 8.5–9.5 $\mu$ in diameter; **spores** hyaline, smooth, ellipsoid to ovoid, often truncate at one end, 6–8 x 5–6 $\mu$.

On living or dead trees, usually on ash, also recorded on willow. Rather rare.

NYBG; SM; CU; LM; CF.

Illustrations: Hard, Mushrooms, p. 421, *f. 350.* 1908; Overholts, Ann. Missouri Bot. Gard. 2:730. *pl. 25, f. 19.* 1915; von Schrenk, U. S. Dept. Agr. Bur. Plant Indus. Bull. 32: *pl. 2, f. 1–3.* 1903.

Type of rot: white mottled rot of the heartwood of white ash, see Hubert, (**2,** pp. 379–381); von Schrenk, U. S. Dept. Agr. Bur. Plant Indus. Bull. 32. 1903; von Schrenk and Spaulding (**13,** pp. 46–47).

**127. Fomes connatus** (Weinm.) Gill.

*F. populinus* (Schum.) Cooke

*Spores 4.5–5 x 3–4 μ, or 3–4 μ in diameter; cystidia and cystidia-like bodies in the hymenium; pores 4–5 per mm.*

**Pileus** sessile, varying to resupinate, corky to somewhat woody, usually convex to subungulate, 2–10 x 3–15 x 0.5–4 cm.; surface white to yellowish, rarely varying to grayish black, often covered with moss or algal growth, velvety-tomentose to glabrous, even, never rimose; margin thick, usually narrowly sterile below; **context** white or whitish, soft-corky to firm, 0.3–1 cm. thick, the hyphae rarely branched, thin-walled, 2–5 μ in diameter; **tubes** white or whitish, distinctly stratified, the strata separated from each other by a thin layer of context, 1–5 mm. long each season, mouths white to yellowish, often glistening, angular, averaging 4–5 per mm., the edges entire to slightly dentate, rather thin; **cystidia** sometimes present, capitate, 3 μ in diameter, also club shaped, sharply angled, and apparently crystalline bodies abundant in the hymenium; basidia 5 μ in diameter; **spores** hyaline, smooth, sometimes one-guttulate, ellipsoid to globose, 4.5–5 x 3–4 μ, or 3–4 μ in diameter.

On the wood of deciduous trees, especially maple, recorded on beech, birch, American elm, red elm, elm unclassified, black gum, hickory, red maple, silver maple, sugar maple, black willow, and on a conifer unclassified (doubtful). Common.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Lloyd, Synop. Genus Fomes, p. 217, *f. 572.* 1915; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:166. *pl. 5, f. 23.* 1914; Overholts, Wash. Univ. Studies 3:94. *pl. 6, f. 29, a–b.* 1915.

Type of rot: white rot of the heartwood of deciduous trees, see Hubert (**2,** p. 387).

*2. Usually on the wood of coniferous trees.*

**128. Fomes pinicola** (Swartz) Cooke

*Polyporus marginatus* (Pers.) Fries; *Fomes ungulatus* (Schaeff.) Sacc.

*Context pallid to light brown, corky to woody; pileus convex to ungulate, dark; margin usually reddish or light colored.*

**Pileus** sessile, woody, convex to ungulate, 5–15 x 5 20 x 3–10 cm.; surface at first often covered with a reddish resinous layer which may persist at the margin, becoming dry, and varying in color from grayish to black, glabrous, usually rather smooth, sulcate with age; margin obtuse and frequently of a lighter color than the rest of the pileus, often sterile below; **context** pallid to light brown, corky to woody, 0.5–2 cm. thick, the hyphae rarely branched, thick-walled, 5–8 μ in diameter; **tubes** usually con-

colorous with the context or sometimes darker, distinctly to indistinctly stratified, 2–7 mm. long each season, mouths white to yellowish and darkening where bruised when fresh, cream to brownish when dry, circular, averaging 3–5 per mm., the edges thick, entire; hair-like **cystidia** usually present, tapering upwards, 2–3.5 $\mu$ in diameter, projecting up to 30 $\mu$ beyond the hymenium; basidia "6–7 $\mu$ broad" (Shope); **spores** "hyaline, smooth, ovoid, 6 8 x 4–5 $\mu$" (Shope), "5–6 x 3.5 $\mu$" (Overholts).

On the wood of coniferous or occasionally of deciduous trees, recorded on balsam, hemlock, pine, black spruce, red spruce, spruce unclassified, apple, ash, large-toothed aspen, basswood, beech, sweet birch, yellow birch, birch unclassified, black cherry, and maple. Common.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Atkinson, Cornell Univ. Agr. Exp. Sta. Bull. 193:221. *f. 80,* p. 222, *f. 81.* 1901 (as Polyporus); Duggar, Fung. Dis. Plants, p. 465, *f. 231.* 1909; Hard, Mushrooms, p. 419. *f. 348.* 1908; Icones Farlowianae, p. 101, *pl. 94.* 1929; Lloyd, Mycol. Notes 54:775. *f. 1168.* 1918 (as *F. marginatus*); Meinecke, Man. Forest Tree Dis. *pl. 14.* 1914; Mounce, Canada Dept. Agr. Bull. N. S. 111, *pl. 1.* 1929; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:166. *pl. 5, f. 24, a–d* (as *F. ungulatus* and var. *pinicola*), p. 168, *pl. 6, f. 25, a–c* (as *F. marginatus*). 1914; Overholts, Wash. Univ. Studies 3:92. *pl. 5. f. 27, a–b.* 1915; Owens, Prin. Plant Path., p. 438, *f. 151.* 1928; Shope, Ann. Missouri Bot. Gard. 18:444. *pl. 33,* (*f. 3* upside down?), and p. 446, *pl. 34, f. 2.* 1931; von Schrenk, U. S. Dept. Agr. Div. Veg. Physiol. and Path. Bull. 25: *pl. 4–5.* 1900 (as Polyporus).

Type of rot: sapwood and heartwood rot of coniferous and deciduous trees, see Irene Mounce, Canada Dept. Agr. Bull. N. S. 111. 1929 (biology).

### 129. **Fomes annosus** (Fries) Cooke

*Context whitish, corky; pileus more or less applanate, deeply sulcate, dark; annual layers loosely cemented together at margins.*

**Pileus** resupinate, effused-reflexed, or sessile, corky to woody, irregular in shape, usually more or less applanate, 0 10 x 5–12 x 0.5–3 cm.; surface grayish brown to a uniform light brown, darker with age, velvety to nearly glabrous; the annual tube layers loosely cemented together at their margins, thus surface deeply sulcate; margin acute, sterile below; **context** whitish, corky, 1 cm. or less thick, the upper part forming a hard, dark, thin pellicle, the hyphae from below the pellicle rarely branched, thick-walled, 3–6 $\mu$ in diameter; **tubes** white or whitish, often in a single layer, unevenly and indistinctly stratified, old tubes usually stuffed, 2–6 mm. long each season, mouths white to yellowish, circular to angular, irregular, averaging 2–4 per mm., the edges moderately to rather thin, usually remaining entire; cystidia none; basidia "4–7 $\mu$ broad" (Shope); **spores** hyaline, smooth, apiculate, ovoid, 4.5–5 x 3.5–4.5 $\mu$.

On the wood of coniferous trees, recorded on red cedar, cedar unclassified, and on pine. Occasional.

NYBG; SM; CU; LM.

Illustrations: Hubert, Outl. For. Path. p. 372, *f. 103.* 1931; Weir, Bull. Vocational Educat. (Idaho) 5, No. 5, p. 47, *f. 15.* 1922; Lloyd, Synop. Genus Fomes, p. 217, *f. 573.* 1915; Shope, Ann. Missouri Bot. Gard. 18:450. *pl. 36.* 1931.

Type of rot: spongy saprot of coniferous trees, see Hubert, (**2,** pp. 370–374).

**130. Fomes officinalis** (Vill.) Fries

*Fomes Laricis* (Jacq.) Murr.

*Context white, friable, bitter; pileus ungulate, whitish.*

**Pileus** sessile, sometimes attached at the vertex, woody, ungulate, often elongate, 5–12 x 5–25 x 5–30 cm.; surface white, yellowish, or grayish, glabrous, sulcate; margin obtuse; **context** white or whitish, "tough when fresh" (Faull), friable in dry specimens, bitter to the taste, 2–5 cm. thick, the hyphae rarely branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** white or whitish, soon becoming white stuffed, indistinctly stratified, 3–8 mm. long each season, mouths white or whitish, or darkening, circular to angular, averaging 3–4 per mm., the edges rather thick to moderately thick, entire; cystidia none; basidia not observed; **spores** hyaline, smooth, ellipsoid to ovoid, 4–5.5 x 3–4 $\mu$.

On the wood of coniferous trees. Not yet reported from New York State but recorded from Ontario and from Massachusetts.

Chlamydospores are reported for this species by Faull (see below) and by Snell (*Phytopathology* 11:173–175. 1921).

Illustrations: Boyce, U. S. Dept. Agr. Bull. 1163: *pl. 6, f. 1.* 1923; Faull, Trans. Roy. Canadian Inst. 11:209. *pl. 18–20.* 1917; Hubert, Outl. For. Path. p. 397, *f. 119.* 1931 (as *F. laricis*); Weir, Bull. Vocational Educat. (Idaho) 5, No. 5, p. 43, *f. 11,* and p. 44, *f. 12.* 1922; Meinecke, Man. For. Tree Dis. *pl. 7.* 1914 (as *F. laricis*); Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:176. *pl. 10.* 1914; Overholts, Wash. Univ. Studies 3:94. *pl. 6, f. 28.* 1915.

Type of rot: brown trunk rot, see Faull, Trans. Roy. Canadian Inst. 11:185–209 (1916) 1917, and Hubert (**2,** pp. 395–398).

*II. Context flesh colored to rose colored, at least when fresh.*

**131. Fomes fraxineus** (Bull.) Cooke

*Spores ovoid to subglobose; pileus plane to convex; on hardwoods.*

**Pileus** annual or more rarely perennial, sessile, corky when fresh, rigid and woody when dry, often imbricate, plane to convex, 4–10 x 5–15 x 1–4 cm.; surface light colored, with reddish or reddish brown stains, or altogether reddish, becoming darker with age, minutely velvety to glabrous, with a thin hard crust; margin thin to thick, narrowly sterile below; **context** somewhat flesh colored when fresh, often fading on drying, punky or soft-corky,

0.4–3 cm. thick, the hyphae rarely branched, thick-walled, 5–9 $\mu$ in diameter; ovoid to subglobose thin-walled cells 12–16 $\mu$ in diameter present or absent in the context; **tubes** concolorous, often in a single layer, 2–10 mm. long each season, mouths whitish to flesh colored, circular to somewhat angular, averaging 4–6 per mm., the edges moderately thick to thick, entire; cystidia none; basidia almost subglobose, 8–10.5 $\mu$ in diameter; **spores** hyaline, smooth, apiculate, ovoid to subglobose, 6–7 x 5–6 $\mu$.

On the wood of deciduous trees, recorded on ash and maple. Rather rare.

NYBG; CU.

Illustrations: Baxter, Papers Michigan Acad. Sci., Arts, Lett. 4[1]: 66. *pl. 3.* (1924) 1925.

**132. Fomes roseus** (Alb. and Schw.) Cooke

*Spores cylindrical; pileus ungulate; on coniferous wood.*

**Pileus** sessile, subwoody, usually ungulate, 2–7 x 2–10 x 2–3 cm.; surface more or less pinkish, often black with age, glabrous or nearly so, sometimes slightly incrusted, rimose when old, sulcate; margin obtuse, sterile below; **context** pinkish or rose colored, soft-corky to hard, indistinctly zonate, 2–10 mm. thick, the hyphae rarely branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** concolorous, distinctly to indistinctly stratified, white stuffed in the older layers, white lined in the younger ones, 1–3 mm. long each season, mouths pinkish or rosy, somewhat brownish with age or where bruised, circular to slightly angular, averaging 3–5 per mm., the edges rather thick to moderately thick, entire; cystidia none; basidia 5–6 $\mu$ in diameter; **spores** hyaline, smooth, cylindrical, 6–8 x 2–3 $\mu$.

On the wood of coniferous trees, recorded on red cedar, white pine, pine unclassified, red spruce, spruce unclassified, and (all doubtful) on beech, birch, maple, and oak. Uncommon.

Compare 107. *Trametes subrosea.*

NYBG; SM; CU; LM; CF; MU.

Illustrations: Lloyd, Synop. Genus Fomes, p. 224, *f. 576.* 1915; Shope, Ann. Missouri Bot. Gard. 18: 436. *pl. 29, f. 4–6.* 1931.

Type of rot: brown top rot of the trunks of coniferous trees. see Hubert (**2,** pp. 384–386).

*III. Context yellowish brown or darker.*

*A. Spores hyaline.*

*1. Setae present.*

**133. Fomes igniarius** (L.) Gill.

*Fomes nigricans* (Fries) Gill.; *Pyropolyporus igniarius* (L.) Murr.

*Pores 4–5 per mm.; pileus large, plane to ungulate; on hardwoods.*

**Pileus** sessile, woody, plane to convex or ungulate, 3–10 x 3–20 x 2–11 cm.; surface grayish black to black, sometimes shiny, becoming glabrous, at first smooth, becoming more or less rimose and

incrusted with age; margin obtuse, sometimes very thick and yellowish brown in color, sterile below; **context** dark brown, woody, 0.5–1 cm. thick, the hyphae rarely branched, thick-walled, 3–4 $\mu$ in diameter; **tubes** concolorous or appearing lighter colored, the older layers conspicuously white stuffed, usually indistinctly stratified, 2–5 mm. long each season, mouths brown, circular, averaging 4–5 per mm., the edges rather thick, entire; **setae** usually abundant, sometimes rare, 6–8 $\mu$ in diameter, projecting 12–16 $\mu$ beyond the hymenium; basidia 6.5–7.5 $\mu$ in diameter; **spores** hyaline, smooth, ovoid to subglobose, 4–6 x 4–5 $\mu$.

On living trees, recorded on aspen, apple, American beech, blue beech, sweet birch, yellow birch, birch unclassified, butternut, hop hornbeam, mountain maple, red maple, maple unclassified, oak, and poplar. Common.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Atkinson, Cornell Univ. Agr. Exp. Sta. Bull. 193:213. *f. 71–72,* p. 214, *f. 73,* p. 215, *f. 74.* 1901 (as Polyporus); Hard, Mushrooms, p. 420. *f. 349.* 1908; Hubert, Outl. For. Path., p. 391. *f. 116.* 1931; Lloyd, Mycol. Notes 29:372. *f. 193* (as *F. nigricans*) and p. 373, *f. 194.* 1908, repeated in Polyp. Issue 1:15. *f. 209* and p. 16, *f. 210.* 1908; Meinecke, Man. For. Tree Dis., *pl. 15.* 1914; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:172. *pl. 8, f. 29, a–d* (as *F. nigricans* and var. *populinus*). 1914; Overholts, Ann. Missouri Bot. Gard. 2:730. *pl. 25, f. 18, 20–21.* 1915 (as var. *nigricans*); Rankin, Man. Tree Dis., p. 307, *f. 59* and p. 308, *f. 60 (f. 61* probably *F. fomentarius)* 1923; Shope, Ann. Missouri Bot. Gard. 18:448. *pl. 35.* 1931; von Schrenk and Spaulding, U. S. Dept. Agr. Bur. Plant Indus. Bull. 149: *pl. 6, f. 1–2.* 1909 (as *F. nigricans*).

Type of rot: white trunk rot of deciduous trees, see Hubert (**2,** pp. 388–395); Meinecke, U. S. Dept. Agr. Tech. Bull. 155. 1929; Schmitz and Jackson, Univ. Minnesota Agr. Exp. Sta. Tech. Bull. 50. 1927; von Schrenk and Spaulding (**13,** pp. 25–37, 42–44).

**133a. Fomes igniarius** var. **laevigatus** Fries

The resupinate form of *Fomes igniarius,* or at least a species very closely related to *F. igniarius.*

This variety is described by Overholts (*Mycologia* 23:126. 1931) as a resupinate fruiting body with pores averaging 4–5 per mm. and spores hyaline, globose, 5–6.5 $\mu$ in diameter. *Fomitiporia betulina* Murr. (*Poria betulina* [Murr.] Kauff.) is given as a synonym.

According to Romell, however, the *Fomes laevigatus* of Fries is a distinct, though closely related (to *F. igniarius*) species. He describes *F. (Pol.) laevigatus* Fries as a resupinate species which is typically thin, with pores 5–7 or 4–8 per mm., and spores 3–5 $\mu$ in diameter, or 4–5 x 3–4 $\mu$ (see *Arkiv för Botanik,* Band 11. No. 3, p. 16. 1911).

On the wood of deciduous trees. Frequent. Specimens under this name are to be found in the following herbaria:

SM; CU; LM; CF.

**134. Fomes pomaceus** (Pers.) Lloyd

*Fomes fulvus* (Scop.) Gill.; *Pyropolyporus fulvus* (Scop.) Murr.

*Pores 4–5 per mm.; pileus small; on pomaceous substrata.*

**Fruiting body** usually resupinate on the under side of branches and by annual growth forming a subcircular to elongated pendant pileus, rarely strictly sessile and convex to ungulate, woody, 0–3 x 2–10 x 0.5–5 cm.; surface usually brown on the margin, gray to grayish black behind, hirsute to glabrous, with age becoming more or less rimose, somewhat incrusted; margin obtuse, sterile below; **context** yellowish brown, woody, 3–8 mm. thick, the hyphae rarely branched, rather thick-walled, 3–4 $\mu$ in diameter; **tubes** brown, occasionally white stuffed in the older layers but not markedly so, 1–4 mm. long each season, mouths brown, circular, averaging 4–5 per mm., the edges rather thick, entire; **setae** infrequent, sometimes apparently absent, 6–8 $\mu$ in diameter, projecting 12–16 $\mu$ beyond the hymenium; basidia 5.5–6.5 $\mu$ in diameter; **spores** hyaline, smooth, subglobose to globose, 4–6 $\mu$.

On pomaceous substrata. Not yet recorded from New York State. The species is very closely related to *F. igniarius,* differing chiefly in its host specialization.

The transfer of this species to the genus Fomes is usually attributed to Bigeard and Guillemin ( *Fl. Champ. France* 2:355. 1913). Lloyd published this combination in Lloyd *Mycol. Notes* 35:469. 1910.

Illustrations: Lloyd, Synop. Genus Fomes, p. 241, *f. 588.* 1915; Overholts, Wash. Univ. Studies 3:96. *pl. 7, f. 35, a–b.* 1915 (as *F. fulvus*); Shope, Ann. Missouri Bot. Gard. 18:446. *pl. 34, f. 4–6.* 1931 (as *F. fulvus*).

Type of rot: brown rot, see von Schrenk and Spaulding (**13,** p. 47).

**135. Fomes conchatus** (Pers.) Gill.

*Pyropolyporus conchatus* (Pers.) Murr.

*Pores 4–7 per mm.; pileus sessile to resupinate; on hardwoods.*

**Pileus** effused-reflexed or resupinate, rarely sessile and then thin and conchate, woody, 0–5 x 4–10 x 0.2–3 cm.; surface grayish brown or yellowish brown to black, tomentose, concentrically sulcate, not rimose but with age becoming incrusted; margin acute, sterile below; **context** brown, woody, containing one to several narrow black lines, 1–3 mm. thick, the hyphae rarely branched, thick-walled, 2–3 $\mu$ in diameter; **tubes** concolorous, indistinctly stratified, 0.5–3 mm. long each season, mouths yellowish brown to dark brown, circular, 4–7 per mm., the edges rather thick, entire; **setae** occasional to rare, ventricose, 5–10 $\mu$ in diameter, projecting up to 20 $\mu$ beyond the hymenium; basidia 4–6 $\mu$ in diameter; **spores** hyaline, smooth, ovoid to subglobose, 4.5–6 x 4–5 $\mu$.

On the wood of deciduous trees, especially ash, recorded on alder, apple, black ash, white ash, beech, birch, black cherry, groundsel tree, hickory, ninebark, sugar maple, and willow. Common. Very similar in appearance to the thin form of *F. Pini* but easily distinguished by the kind of substratum and its smaller pores.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Overholts, Wash. Univ. Studies 3:94. *pl. 6, f. 33, a–c.* 1915.

**Fomes densus** Lloyd *Synop. Genus Fomes* (1915), p. 245, has been reported from Ohio and eventually, no doubt, will be recognized from New York State. According to Lloyd this species is a thick, heavy form of *F. conchatus.* Overholts (*Mycologia* 23:126. 1931) separates it from *F. conchatus* on more certain characters. According to him the pores are smaller, averaging 8–10 per mm., and the spores are pale rusty, 3–3.5 $\mu$ in diameter. It grows on a substratum of the wood of deciduous trees.

### 136. **Fomes Pini** (Thore) Lloyd

*Trametes Pini* (Thore) Fries; *T. piceina* Peck; *T. Abictis* Karst.; *Polyporus piceinus* Peck; *Polystictus piceinus* (Peck) Sacc.; *Porodaedalea Pini* (Thore) Murr.

*Pores 1–4 per mm.; pileus sessile to resupinate; on coniferous wood.*

**Pileus** annual or perennial, sessile, effused-reflexed, or resupinate, thin and conchate, or ungulate, 0–15 x 1–20 x 0.3–15 cm.; surface at first yellowish brown to reddish brown with elevated zones of appressed tomentum, becoming grayish black or brownish black toward the base, or, in the ungulate form, becoming blackish, glabrous, cracking and becoming rough; margin obtuse to acute, sterile or fertile below; **context** yellowish brown to reddish brown, woody, 1–5 mm. thick, the hyphae rarely branched, rather thick-walled, 3–5 $\mu$ in diameter; **tubes** concolorous or lighter colored, the walls whitish incrusted, in one layer or indistinctly stratified, 2–6 mm. long each season, mouths yellowish brown to reddish brown, angular to sinuous or daedaloid, usually 3–4 per mm., or, in the ungulate form, 1–3 per mm., the edges thin, entire; **setae** abundant, 8–12 $\mu$ in diameter, projecting up to 30 $\mu$; basidia 4–5 $\mu$ in diameter; **spores** hyaline to brown, smooth, subglobose to globose, 4–5 $\mu$.

On living or dead coniferous trees, recorded on hemlock, larch, white pine, pine unclassified, black spruce, red spruce, spruce unclassified, and on cut timber. Common. The ungulate form is said to be common on living white pine and spruce while the thin reflexed form occurs usually on down spruce.

NYBG; SM; LM; CU; CF; MU.

Illustrations: Abbott, Vermont Agr. Exp. Sta. Bull. 191:18. *pl. 3.* 1915 (as Trametes); Lloyd, Synop. Genus Fomes, p. 275, *f. 608–609* and p. 276, *f. 610* (as *Trametes piceina*) 1915; Meinecke, Man. Forest Tree Dis. *pl. 1–5.* 1914 (as Trametes); Shope, Ann. Missouri Bot. Gard. 18:442. *pl. 32, f. 2–3.* 1931.

Type of rot: red ring rot, see Abbott, Vermont Agr. Exp. Sta. Bull. 191. 1915; Hubert (**2,** pp. 399–411); and Percival, W. C., N. Y. S. Coll. Forestry Tech. Publ. 40. 1934 (biology).

*2. Setae absent.*

**137. Fomes fomentarius** (L.) Gill.

*Elfvingia fomentaria* (L.) Murr.; *Elfvingiella fomentaria* (L.) Murr.

*Spores 12–16 x 4–5 μ; context dark brown, punky; crust thick.*

**Pileus** sessile, woody, convex to ungulate, 3–10 x 5–15 x 3–10 cm.; surface grayish to brown or grayish black, glabrous, concentrically sulcate, with a thick horny crust which is black and shiny in section; margin thick and obtuse, narrowly sterile below; **context** dark brown, soft and punky, indistinctly zonate, 0.3–3 cm. thick, the hyphae rarely branched, thick-walled, 5–10 μ in diameter; **tubes** lighter colored than the context, usually white stuffed or white incrusted, rather distinctly stratified, 0.3–2.5 cm. long, mouths grayish to brown, circular, averaging 3 per mm., the edges thick, entire; cystidia or setae none; basidia not observed; **spores** hyaline, smooth, cylindric-ellipsoid, 12–16 x 4–5 μ.

On living and dead deciduous trees, especially birch, recorded on large-toothed aspen, beech, paper birch, sweet birch, yellow birch, birch unclassified, and sugar maple. Common.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Kellerman, Jour. Mycol. 9:169. *pl. 3.* 1903; Lloyd, Synop. Genus Fomes, p. 236, *f. 584* (sectional figure upside down) 1915; Marshall, Mushroom Book, p. 110. 1905; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:174. *pl. 9, f. 30, a–b.* 1914; Overholts, Wash. Univ. Studies 3:94. *pl. 6, f. 32, a–b.* 1915; Rankin, Man. Trees Dis., p. 106, *f. 11.* 1923; von Schrenk and P. Spaulding, U. S. Dept. Agr. Bur. Plant Indus. Bull. 149: *pl. 8, f. 1.* 1909; White, Connecticut Geol. and Nat. Hist. Surv. Bull. 3:63. *pl. 35.* 1905.

Type of rot: white mottled rot of heartwood and sapwood, see Hubert (**2,** p. 379); and von Schrenk and Spaulding (**13,** pp. 50–51).

**138. Fomes robustus** Karst.

*F. Bakeri* (Murr.) Sacc.; *Pyropolyporus Bakeri* Murr.

*Spores 5–6 μ in diameter; context bright yellowish brown, woody.*

**Pileus** sessile, woody, convex to compressed-ungulate, 3–8 x 5–15 x 2–5 cm.; surface usually brown or grayish brown on the margin, grayish black to black behind, glabrous, smooth or cracking somewhat with age but scarcely rimose; margin thick, acute to obtuse, with a broad rusty red band, more or less fertile below; **context** bright yellowish brown, shining, woody, fibrous, zonate, 1–2.5 cm. thick, the hyphae rarely branched, thick-walled, 4–6 μ

in diameter; **tubes** appearing lighter in color than the context, distinctly to indistinctly stratified, more or less white incrusted or stuffed in the older layers, 4–7 mm. long each season, mouths brown, circular, averaging 4–6 per mm., the edges thick, entire; setae none; cystidia none or represented by hyaline, blunt bodies about 6 μ in diameter scarcely projecting from the hymenium: basidia 9.5–10.5 μ in diameter; **spores** hyaline, smooth, one-guttulate, subglobose, 5–6 μ.

On deciduous or coniferous trees, all collections so referred uncertain. The species has been collected in neighboring states.

Illustrations: Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:168. *pl. 6, f. 27a,* and p. 170, *pl. 7, f. 27, b–d.* 1914 (as *F. Bakeri*); Overholts, Wash. Univ. Studies 3:94. *pl. 6, f. 31.* 1915 (as *F. Bakeri*); and in Mycologia 12:142. *pl. 9.* 1920 (as *F. Bakeri*).

*B. Spores brown.*

*1. Context duplex; setae none; spores smooth.*

**139. Fomes Ribis** (Schum.) Gill.

*Pyropolyporus Ribis* (Schum.) Murr.

*Pileus applanate, velvety at margin; at the base of Ribes bushes.*

**Pileus** sessile, corky to subwoody, thin and applanate, 2–12 x 2–20 x 0.5–1.5 cm.; surface light brown to dark brown, grayish to black with age, sometimes green with moss and algal growth, minutely velvety near the margin, zoned or sulcate behind, in age sometimes becoming slightly incrusted; margin obtuse to acute, sterile below; **context** yellowish brown, duplex, soft and spongy above, woody and lighter colored next the tubes, the two portions separated by a thin dark line, 2–10 mm. thick, the hyphae from next the tubes rarely branched, thin- to medium thick-walled, 3.5–5 μ in diameter; **tubes** concolorous with the adjacent context, indistinctly stratified, 0.5–3 mm. long each season, mouths yellowish brown to reddish brown, circular to angular, averaging 5–7 per mm., the edges entire, moderately thick to thick; cystidia or setae none; basidia 4–5 μ in diameter; **spores** pale to light brown under the microscope, smooth, ellipsoid to subglobose, 2.5–4 x 2.5–3 μ.

At the base of stems of cultivated Ribes, recorded only on current bushes. Rather rare.

NYBG; SM; CU; CF; MU.

Illustrations: Lloyd, Synop. Genus Fomes, p. 252. *f. 594.* 1915; Overholts, Wash. Univ. Studies 3:94. *pl. 6, f. 30, a–c.* 1915.

Type of rot: heartrot of sassafras, see Spaulding, Science (N.S.) 26:479, 480. 1907.

*2. Context homogeneous, woody; setae present or absent; spores smooth (compare also 136. F. Pini).*

**140. Fomes Everhartii** (Ell. and Gall.) von Schrenk

*Pyropolyporus Everhartii* (Ell. and Gall.) Murr.

*Setae present; context dull reddish brown; usually on oak.*

**Pileus** sessile, woody, convex, rarely ungulate, 5–15 x 5–30 x 2–15 cm.; surface at first uniformly yellowish brown, becoming grayish black or black behind but remaining brown on the margin, velvety when young, rough and rimose with age, concentrically sulcate; margin obtuse, fertile below; **context** reddish brown, woody, somewhat zonate, 1–4 cm. thick, the hyphae rarely branched, thin- to thick-walled, 3–6 $\mu$ in diameter; **tubes** more or less concolorous, indistinctly stratified, somewhat white incrusted within, 2–6 mm. long each season, mouths brown, glancing, circular to angular, averaging 4–6 per mm., the edges thin, entire; **setae** 6–9 $\mu$ in diameter, projecting up to 20 $\mu$ beyond the hymenium; basidia not observed; **spores** brown, smooth, ellipsoid to globose, 4–4.5 x 3–3.5 $\mu$ or 4–5 $\mu$ in diameter.

On living trunks of deciduous trees, usually oak, recorded on beech, swamp oak, and oak unclassified. Uncommon.

NYBG; SM; CU; LM; CF.

Illustrations: Hirt, Mycologia 22:311. *pl. 25. f. 1–4.* 1930; Neuman, Wisconsin Geol. and Nat. Hist. Surv. Bull. 33:168. *pl. 6, f. 26a* and p. 170. *pl. 7, f. 26b.* 1914; Overholts, Wash. Univ. Studies 3:94. *pl. 6, f. 34, a–b.* 1915.

Type of rot: white spongy heartrot of deciduous trees, see Hirt, Mycologia 22:310–311. 1930; Hubert (**2,** pp. 378, 379); Hedgcock, Phytopathology 2:74, 75. 1912; and Graves, Mycologia 11:120–121. 1919.

**141. Fomes rimosus** (Berk.) Cooke

*Fulvifomes Robineae* Murr.; *Pyropolyporus Robineae* Murr.

*Setae absent; context bright yellowish brown; on locust.*

**Pileus** sessile, woody, convex to ungulate, 5–20 x 5–30 x 2–10 cm.; surface at first uniformly brown and velvety, darkening and soon becoming minutely strigose, then black and glabrous, incrusted and rimose with age, concentrically sulcate; margin thick to thin, obtuse, often remaining brown and velvety for some time, sterile or fertile below; **context** bright yellowish brown, shining, woody, fibrous, zonate, 0.5–3 cm. thick, the hyphae rarely branched, rather thick-walled, 3–5 $\mu$ in diameter; **tubes** more or less concolorous with the context, indistinctly stratified, 1–4 mm. long each season, mouths brown, circular, averaging 5–6 per mm., the edges rather thick, entire; cystidia or setae none; basidia 6–7.5 $\mu$ in diameter; **spores** brown, smooth, subglobose to globose, 4–5 $\mu$.

On the trunks of living locust (Robinia). Common.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Hard, Mushrooms, p. 418, *f. 347*. 1908; Overholts, Wash. Univ. Studies 3:96. *pl. 7, f. 38, a–b*. 1915; Rankin, Man. Tree Diseases, p. 220, *f. 35*. 1923; von Schrenk, Ann. Rept. Missouri Bot. Gard. 12:31. *pl. 1–2*. 1901 (as Polyporus).

Type of rot: yellow heartrot of locust, see von Schrenk, Ann. Rept. Missouri Bot. Gard. 12:21–32. 1901; von Schrenk and Spaulding (**13,** pp. 45–46).

*3. Context homogeneous, soft and punky; setae none; spores appearing echinulate.*

**142. Fomes lobatus** (Schw.) Cooke

*Elfvingia lobata* (Schw.) Murr.; *E. reniformis* (Morg.) Murr.

*Spores 8–11 x 5–7 μ; pileus reviving, of moderate size.*

**Fruiting body** reviving for two or three years and producing each year a pileus below the one of the previous year; **pilei** sessile or more often appearing substipitate, corky, 4–10 x 4–15 x 1–3 cm.; surface yellowish brown or reddish brown to dark brown, glabrous, covered with a thin but distinct, easily indented crust; margin thin, acute, narrowly sterile below; **context** dark brown, soft and punky, 0.3–1.5 cm. thick, the hyphae rarely branched, usually thick-walled, 3–6 μ in diameter; **tubes** more or less concolorous with the context, not stratified, 0.3–1 cm. long, mouths white, yellowish, or brown, darker where bruised, circular to subcircular, averaging 4–5 per mm., the edges rather thin, entire; cystidia or setae none; basidia 9–10 μ in diameter; **spores** pale brown, appearing minutely echinulate, ellipsoid to ovoid with a truncate apex, 8–11 x 5–7 μ.

On deciduous trees, recorded only on red oak. Rare, one collection recorded, Brooklyn, W. A. Murrill.

NYBG.

Illustrations: Overholts, Wash. Univ. Studies 3:96. *pl. 7, f. 36, a–b*. 1915.

**143. Fomes applanatus** (Pers.) Gill.

*F. leucophaeus* (Mont.) Cooke; *F. megaloma* (Lév.) Cooke; *Elfvingia megaloma* (Lév.) Murr.; *Ganoderma lipsiensis* (Batsch) Atk.

*Spores 5–7 x 4–5 μ; pileus truly perennial, becoming very large.*

**Pileus** sessile, woody, plane to convex, 5–30 x 5–50 x 2–10 cm.; surface usually grayish or grayish black, covered with a thick horny crust which is black and shiny in section, or more rarely with a thin crust; margin obtuse, sterile below; **context** dark brown, punky to soft corky, 0.5–3 cm. thick, the hyphae rarely branched, thick-walled, 3–6 μ in diameter; **tubes** when young more or less concolorous with the context, becoming white stuffed, rather distinctly stratified, each layer usually separated by a distinct layer of context, 0.4–1.5 cm. long each season, mouths white when young, or rarely yellowish, darker where bruised, in age becoming con-

colorous with the tubes, circular, averaging 4–6 per mm., the edges moderately thick to rather thin, entire; cystidia or setae none, but, according to Shope, "hymenium containing simple or forked, unequally thickened hyphae which extend beyond the basidia"; basidia "5–7 $\mu$ broad" (Shope); **spores** brown, appearing slightly echinulate, ovoid with a truncate apex, 5–7 x 4–5 $\mu$.

On living or dead deciduous or rarely coniferous trees, recorded on American beech, blue beech, birch, sour cherry, cherry unclassified, cottonwood, elm, groundsel tree, hickory, laurel, Prunus sp., sugar maple, oak, willow, balsam, and hemlock. Common.

NYBG; SM; CU; LM; CF; BM; MU.

Illustrations: Atkinson, Cornell Univ. Agr. Exp. Sta. Bull. 193:223. *f. 82.* 1901, and Ann. Mycol. 6: *t. 2–3.* 1908 (as Polyporus), also in Mushrooms, ed. 3, p. 15, *f. 15.* 1911 (as Polyporus); Hesler, Jour. Tennessee Acad. Sci. 4:7. *f. 4.* 1929; Krieger, Nat. Geogr. Mag. 37:409. 1920; Lloyd, Mycol. Notes 62: *pl. 152, f. 1729.* 1920 (as Polyporus); Overholts, Wash. Univ. Studies 3:96. *pl. 7, f. 37, a–b.* 1915; Shope, Ann. Missouri Bot. Gard. 18:442. *pl. 32, f. 4.* 1931 (as Ganoderma); von Schrenk and Spaulding, U. S. Dept. Agr. Bur. Plant Indus. Bull. 149:59. *f. 8.* 1909; E. A. White, Connecticut Geol. and Nat. Hist. Surv. Bull. 3:63. *pl. 35.* 1905; J. H. White, Trans. Roy. Canadian Inst. 12:174. *pl. 2, f. 1.* 1919.

Type of rot: white butt rot of deciduous trees, see Hubert (**2,** pp. 374–378); Meinecke, U. S. Dept. Agr. Tech. Bull. 155. 1929; White, Trans. Roy. Canadian Inst. 12:133–174. 1919 (biology).

OBSERVATIONS

*Hartigii* (Allesch.) Sacc. and Trott., *Fomes.* The coniferous form of *F. robustus.* Two specimens at CU, on hemlock, Ithaca, are species of Poria.

*laevigata* var. *exaculeata, Poria.* CU no. 6045. Not studied.

*nigricans* Rost. non Fries, *Fomes.* SM., Osceola, on *Betula lutea.* Det. J. R. Weir. The specimen does not appear to differ from *F. igniarius* as described herein, but the spores were not demonstrated.

*Norae-Angliae* (Berk.), *Fomes.* Doubtfully reported by Lloyd in *Letter* 11:7. 1906. The species is considered synonymous with *F. igniarius* by Shope (**15,** p. 382), doubtfully synonymous with *F. igniarius* by Murrill (**7,** p. 103), but Lloyd (**5,** p. 283) states "The type, a single specimen, is a thin, brown Polyporus, closely related to Polyporus rutilans."

*obducens* (Pers.), *Poria.* Usually considered to be the resupinate form of *F. connatus.*

*salicinus* (Pers.) Gill., *Fomes.* Usually considered to be a form of *F. conchatus* on willow. Collections at Albany referred to various species of Poria.

*ulmarius* (Sow.), (*Fomes*) *Polyporus.* Reported in *N.Y.S. Mus. Rept.* 23:52. 1873. Specimen not found at Albany. According to Lloyd (**5,** p. 228) the typical form of this species is not found in the United States but *F. geotropus,* which occurs in the Gulf States, is the tropical form of it and is probably the same species. *Bresadola* (*Ann. Mycol.* 18:68. 1920), Hemmi *et al.* (Bot. Mag. [Tokyo] 43:674. 1929), and Hemmi (*Mem. Coll. Agr. Kyoto Imp. Univ.* No. 20 [*Phytopath. Series* No. 5], p. 4. 1932) consider *F. geotropus* to be synonymous with *F. ulmarius.*

### GANODERMA Karst.

Fruiting body annual, sometimes persisting for two or three years, stipitate or sessile, leathery to woody; surface covered with a thin, reddish, yellowish, or olivaceous crust; context white to brown; pore mouths circular to angular; cystidia or setae none; spores brown, the endospore with minute spines which project into or through the epispore, the spore thus appearing echinulate.

The peculiar spores characterize the genus. In a more extensive treatment, especially of tropical species, the description of the genus should include related typically perennial species such as *Fomes applanatus* and *F. lobatus*, which have similar spores. For the purposes of usefulness, however, it seems best to retain these species in the genus Fomes, since *F. applanatus* so strikingly exhibits the essential feature of the genus, namely the perennial habit as shown by the stratified tubes. This character is more convenient to use than the spore character. *F. lobatus* is so closely related that it must be placed near *F. applanatus* in any classification.

The taxonomy of the New York State species, and of others, has been treated very ably by Haddow in the *Jour. Arnold Arboretum* 12:25–46. 1931. White (*Trans. Roy. Canadian Inst.* 12:138. 1919) first correctly interpreted the structure of the spore wall. Later Coleman (*Bot. Gaz.* 83:48–60. 1927) confirmed and extended White's observations by cytological methods.

KEY TO THE SPECIES

1. Fruiting body usually stipitate ..... 2
   Fruiting body sessile, or appearing substipitate ..... 3
2. Surface of the pileus bright red to deep mahogany or almost black; margin usually acute ..... *144. G. lucidum*
   Surface yellowish brown or more or less olivaceous; margin thick and obtuse when mature ..... *145. G. Curtisii*
3. Surface laccate, light red to brownish red or darker ..... *146. G. sessile*
   Surface not laccate, with a thin to thick grayish or darker crust .... 4
4. Fruiting body typically perennial, the tubes stratified; spores 5–7 x 4–5 $\mu$ ..... See *143. Fomes applanatus*
   Fruiting body reviving for 2–3 years, producing pilei which come out below those of the previous year, thus tubes not stratified; spores 8–11 x 5–7 $\mu$ ..... *See 142. Fomes lobatus*

### 144. Ganoderma lucidum (Leyss.) Karst.

*G. Tsugae* Murr.; *Polyporus lucidus* (Leyss.) Fries; *P. Tsugae* (Murr.) Overh.; *Polyporus metallicus* Lloyd

*Pileus stipitate, bright red to almost black; margin usually acute.*

**Stem** lateral, elongated to short tuberculate, rarely lacking, surface dark, laccate, 4–12 cm. long, 1.5–3 cm. thick; **pileus** leathery to corky, dimidiate to reniform, 5–15 x 6–25 x 1–4 cm.; surface heavily laccate, bright red to deep mahogany or almost black, glabrous, sulcate; margin usually acute, sterile below; **context** white to light brown, darker next the tubes, felty to corky, rarely

radiately fibrous, 0.2–2 cm. thick, the hyphae thick-walled, usually of two kinds, some infrequently branched, 4–15 $\mu$ in diameter, others much branched, 1–4 $\mu$; **tubes** cinnamon brown to dark brown, rarely in two layers, 0.2–1.5 cm. long, mouths white to brown, when fresh glaucous, turning brown where bruised, circular to angular, averaging 3–6 per mm., the edges moderately thick to rather thick, entire; cystidia none; basidia not observed; **spores** light brown, appearing coarsely echinulate, ovoid with a truncate apex, 10–12 x 6–7.5 $\mu$.

On the wood of coniferous or deciduous trees, recorded on hemlock, yellow birch, birch unclassified, cherry, elm, Norway maple, red maple, maple unclassified, and oak. Common.

NYBG; SM; CU; LM; CF; MU.

Illustrations: Atkinson, Bot. Gaz. 46:323. *f. 1.* 1908 (as *G. pseudoboletum*), also in Mushrooms, ed. 3, p. 193, *pl. 72, f. 188.* 1911 (as Polyporus); Güssow and Odell, Mushrooms and Toadstools, p. 195, *pl. 100, f. 2.* 1927; Haddow, Jour. Arnold Arboretum 12:46. *pl. 29, f. 1–3.* 1931; Hard, Mushrooms, p. 404, *f. 332.* 1908 (as Polyporus); Lloyd, Mycol. Notes 65. *pl. 175, f. 1904.* 1920 (as Polyporus); Overholts, Wash. Univ. Studies 3:90. *pl. 4, f. 20, a–b* (as Polyporus) and p. 92. *pl. 5, f. 23, a–b.* 1915 (as *P. Tsugae*).

Type of rot: saprot of hemlock, see West, Mycologia 11:262–266. 1919.

**145. Ganoderma Curtisii** (Berk.) Murr.

*Polyporus Curtisii* Berk.

*Pileus stipitate, yellowish brown or olivaceous; margin obtuse.*

**Stem** usually lateral, or excentric to central, laccate, yellowish brown to brick red, 3–6 cm. long, 1.5–2.5 cm. thick; **pileus** firm to hard, reniform to circular, 3–15 x 3–20 x 0.7–3 cm.; surface yellowish-brown or more or less olivaceous, thinly laccate, glabrous, often zonate; margin usually thick and obtuse when mature, sterile below; **context** duplex, the lower layer dark chocolate brown and firm, the upper layer nearly white and soft, felty to radiately fibrous, 0.5–1.5 cm. thick, the hyphae hyaline to brown, infrequently to frequently branched, thick-walled, 3–5 $\mu$ in diameter; **tubes** cinnamon brown to dark brown, 0.3–1.2 cm. long, mouths whitish to brownish, circular to subcircular, averaging 3–5 per mm., the edges thin, entire; cystidia none; basidia not observed; **spores** light brown, appearing echinulate, variable in size and shape, mostly ovoid, sometimes truncate at one end, 9.5–11 x 5–6 $\mu$.

On the wood of deciduous trees, recorded on apple, maple, oak, and peach. Rather rare, and has been found only in the vicinity of New York City. Summer and fall.

NYBG; SM; CU; LM.

Illustrations: Atkinson, Bot. Gaz. 46:327. *f. 3.* 1908; Haddow, Jour. Arnold Arboretum 12:46. *pl. 29, f. 6.* 1931; Overholts, Wash. Univ. Studies 3:90. *pl. 4, f. 21.* 1915 (as Polyporus).

**146. Ganoderma sessile** Murr.

*Polyporus sessilis* (Murr.) Lloyd

*Pileus sessile, light red to brownish red or darker.*

**Pileus** sessile, rarely stipitate, dimidiate, plane to slightly convex above, usually thickened behind, 5–15 x 7–25 x 1–3 cm.; surface light red to brownish red or darker, thinly laccate, frequently concentrically sulcate; margin acute, sterile below; **context** duplex, consisting of an upper light brown and a lower cinnamon brown to chocolate brown layer, radiately fibrous, 0.2–1.5 cm. thick, the hyphae thick-walled, of two kinds, some rarely branched, 4–8 $\mu$ in diameter, others often branched, 1–3 $\mu$; **tubes** cinnamon brown to dark brown, 0.5–2 cm. long, mouths whitish to dark brown, glaucous, turning brownish where bruised, circular to angular, averaging 3–5 per mm., the edges thin, entire; cystidia none; basidia not observed; **spores** light brown, thin-walled, appearing echinulate, ovoid, usually truncate at the apex, 10.5–12 x 6–7 $\mu$.

On the wood of deciduous and of coniferous trees, recorded on birch, elm, red maple, maple unclassified, black oak, oak unclassified, sycamore, and Norway spruce. Frequent.

NYBG; SM; CU; LM; CF.

Illustrations: Haddow, Jour. Arnold Arboretum 12:46. *pl. 29, f. 4–5.* 1931.

Type of rot: probably a wound parasite, destroying bark and cambium, see Pollock in Rept. Mich. Acad. Sci. 7:53–54. 1905.

OBSERVATIONS

*pseudoboletum* (Jacq.) Murr., *Ganoderma.* As recorded in *Torreya* 14:215. 1914, subsequently changed to *G. Curtisii* (*Torreya* 21:9. 1921). *G. pseudoboletum* is a synonym of *G. lucidum.*

GLOSSARY

*Acute* (*of the margin*). Narrowed to a point.

*Adnate* (*of the tubes*). Attached to the stem for the length of the tubes but not running down the stem.

*Agglutinate.* Uniting or fusing together, as if by glue; collapsing and adhering together.

*Allantoid.* Elongate and curved, with the sides parallel; sausage shaped. See Illus. II, fig. 32.

*Anastomosing.* Running together irregularly; forming a network.

*Apiculate.* Provided with an apiculus, a short often sharp papilla by which the spore was attached to the sterigma. See Illus. II, fig. 38.

*Applanate.* Flattened out horizontally; horizontally expanded. See Illus. I, fig. 5.

*Appressed* (*of scales, fibrils, hairs, etc.*). Closely pressed to the surface.

*Areolate.* With the surface marked out into small areas or spaces.

*Attenuate.* Tapering or narrowing.

*Azonate.* Without zones.

*Basidium* (plural *basidia*). The specialized terminal cell of a hypha in the hymenium that bears the spores in the basidiomycetes. See Illus. II, fig. 30.

*Branched* (*of the hyphae*). With the hyphae dividing, see Illus. II, fig. 23.

*Brittle.* Easily broken, descriptive of the pileus when the context dries hard.

*Buff.* Brownish yellow.

*Bulbous* (*of the stem*). With a swollen or enlarged portion at the base.

*Caespitose.* Occurring in clumps or clusters, the pilei arising from about the same point.

*Capitate.* With a head (of cystidia, see Illus. II, fig. 28).
*Cartilaginous* (*of consistency*). Tough, like cartilage.
(*of appearance*). Translucent, somewhat like oiled paper.
*Central* (*of the stem*). Attached to the middle or center of the cap or pileus.
*Chestnut brown.* Dark reddish brown.
*Ciliate.* Fringed with hairs.
*Cinereous.* Ash colored; a dirty white.
*Cinnabar red.* A bright deep red; vermilion.
*Clavate* (*of cystidia*). Thickened at the apex; club shaped.
*Cm.* Centimeter.
*Collapsed* (*of the dissepiments*). Caving in upon one another.
*Colliculose* (*of the surface*). Covered with small elevations.
*Compressed* (*of the stem or teeth*). Flattened transversely.
*Compressed globose.* Nearly spherical, but flattened somewhat.
*Compressed ungulate.* Hoof shaped, but flattened somewhat.
*Conchate.* Thin, curved, shaped like a shell, see Illus. I, fig. 7.
*Concolorous.* Of the same color.
*Confluent.* Running together; joining or fusing.
*Context.* The inner substance of the pileus or cap.
*Conical.* Shaped like a cone; with a circular base and tapering above to a point.
*Conidium* (plural *conidia*). Asexual or vegetative spores.
*Convex.* Curving outward; arched.
*Coriaceous.* Leathery in texture. *Polyporus pargamenus, P. versicolor,* or *Daedalea unicolor* typically illustrate this quality of texture.
*Crisped* (*of the margin*). With small folds; wrinkled.
*Crust.* A differentiated layer of tissue over the softer tissue, usually hard to indent or break through.
*Cylindrical* (*of the spores*). More or less elongated and with the sides parallel, circular in cross section. See Illus. II, fig. 31.
*Cystidium* (plural *cystidia*). Sterile modified terminal cell of a hypha in the hymenium that is conspicuous (usually larger in diameter than the basidia), usually colorless, and thin walled. See Illus. II, fig. 28.
*Daedaloid* (*of the pore mouths*). Elongate and sinuous. See Illus. I, fig. 15.
*Decurrent* (*of the tubes*). Extending down the stem.
*Dentate.* Toothed, see Illus. I, fig. 16.
*Denticulate.* Finely dentate.
*Depressed* (*of the pileus*). Central portion lower than the margin; with the center concave. See Illus. I, fig. 8.
*Determinate* (*of the margin*). Definite; having a distinct outline.
*Dimidiate.* Semicircular in outline; half round.
*Dissepiment.* Wall of the tube. See Illus. II, fig. 29.
*Dorsal.* Upper portion or side.
*Dry* (*of the surface*). Not sticky or watery when fresh.
*Duplex* (*of the context*). Of two parts, the portion next the tubes firm, the other portion soft and spongy.
*Echinulate.* With minute spines. See Illus. II, fig. 40.
*Effused-reflexed* (*of the pileus*). Closely applied to the substratum except the margin which is turned out to form the pileus, see Illus. I, fig. 3.
*Ellipsoid* (*of the spores*). Evenly narrowing to the rounded ends, longer than broad, usually at least twice as long as broad. See Illus. II, fig. 33.
*Endospore.* The inner layer of the wall of a spore.
*Entire* (*of the edges of the pores*). Smooth, without any indentations.
*Epispore.* The outer layer of the wall of a spore.
*Equal* (*of the stem*). Of the same diameter throughout.
*Epixylous.* Growing on wood.
*Excentric.* Not in the center.
*Farinaceous.* Mealy, with the taste or odor of meal.
*Fibrils.* Minute fibers.
*Fibrillose.* Covered with or composed of minute fibers.
*Fibrous.* Composed of fibers which are rather tough.
*Fimbriate.* Fringed, see Illus. I, fig. 17.
*Firm* (*of the context*). Moderately resisting indenting by the fingernail.

*Flabelliform.* Fan-shaped in outline.
*Fleshy tough.* When fresh, watery but rather leathery in texture.
*Floccose.* Downy; woolly.
*Fragile* (*of the context*). When dry, the needle breaking out small blocks of tissue rather than threads from the firm context.
(*of the pileus*). When dry firm to rather soft but easily broken, the context soft to firm but not hard.
*Friable* (*of the context*). Easily crumbling, the hyphae of the dry context breaking up into short pieces when picked with a needle.
*Glabrous.* With neither hairs nor free scales, not necessarily smooth or even but usually so.
*Glancing* (*of the tubes*). Changing appearance when the angle of incidence of the light is altered.
*Glaucous.* Covered with a bloom.
*Globose.* Spherical or almost so.
*Guttulate* (*of the spore*). With one or more globules within the spore. See Illus. II, fig. 38.
*Hard* (*of the context*). Strongly resisting indentation by the fingernail.
*Hexagonal.* Six-sided, the sides and angles more or less regular.
*Hirsute.* Covered with stiff hairs.
*Hispid.* Covered with rough hairs or bristles.
*Hyaline.* Colorless.
*Hymenium.* The fruiting layer; in the polypores lining the walls of the tubes and composed of basidia with or without sterile structures such as cystidia, setae, paraphyses, or hyphal pegs. See Illus. II, fig. 29.
*Hypha* (plural *hyphae*). The individual threads or vegetative part of the fungus.
*Hyphal pegs.* Clusters or fascicles of closely agglutinated hyphae projecting into the lumen of the tubes. See Illus. II, fig. 27.
*Imbricate.* Overlapping on one another, like the shingles on a roof. See Illus. I, fig. 13.
*Incised.* Deeply cut; as if cut into. See Illus. I, fig. 19.
*Incrusted* (*of the hyphae or cystidia*). Covered wholly or partly with small crystals.
(*of the surface*). With a thin or thick hard layer or crust over the softer tissue.
*Incurved.* Bent inward.
*Indigo.* A deep violet-blue color.
*Infundibuliform.* Funnel-shaped, see Illus. I, fig. 10.
*Innate* (*of fibrils*). Appearing as if composed of the substance itself; blending with the substance.
*Involute.* Rolled tightly inward or down upon itself.
*Irpiciform.* Teeth-like; broken up into teeth.
*Irregular* (*of the hyphae*). Diameter changing often, usually abruptly.
(*of the margin*). Not in a continuous smooth line; not even.
*KOH solution.* A 3 per cent solution of potassium hydroxide.
*Labyrinthiform.* With intricate sinuous or winding appearance; serpentine.
*Laccate.* As though varnished.
*Lacerate.* Irregularly cut, as though torn.
*Lamella* (plural *lamellae*). The flat, expanded, knife-blade like plate on the under side of the pileus; a gill.
*Lamellate.* With lamellae or gills.
*Lateral* (*of the stem*). Attached on one side.
*Laterally confluent.* Joining at the margin, as where the margin of one pileus unites with the margin of another pileus.
*Lobed* (*of the margin*). With rather large rounded divisions and broad sinuses.
*Mealy.* Floury; like meal.
*Mm.* Millimeter.
*Mouths.* Openings of the tubes.
*Mycelium.* The mass of hyphae which make up the vegetative portion of a fungus.
*Obtuse* (*of the margin*). Rounded; blunt.

*Ochraceous.* Yellow tinged with red or brown.
*Ovoid.* Egg-shaped, thick and rounded at one end, tapering with convex sides to the other end. See Illus. II, fig. 38.
*Pallid.* With little color; an indefinite pale whitish or pale brownish color.
*Paraphysis* (plural *paraphyses*). Inconspicuous sterile hyphal structures in the hymenium; the scarcely modified free ends of hyphae which are usually less than the diameter of the basidia. See Illus. II, fig. 24.
*Pedicellate.* With a stalk; borne on a stalk.
*Pellicle.* A thin skin-like or cuticle-like covering easily broken, not hard like a crust.
*Pelliculose.* With a pellicle.
*Perennial.* Persisting for several years, strictly speaking at least more than two. In polypores the perennial habit is indicated by the layering of the tubes.
*Pileolus* (plural *pileoli*). A small cap or pileus.
*Pileus* (plural *pilei*). The cap or shelf-like portion of the fruiting body that bears the fruiting layer, or tubes, on the lower side.
*Plane* (*of the margin*). Evenly horizontal.
(*of the pileus*). Flat.
*Polystictus type.* Leathery or coriaceous kind of fruiting bodies, tough and flexible when fresh, and usually so when dry.
*Poroid.* With pores.
*Proliferation.* An extension of the pileus; an excessive development of part of the pileus.
*Pruinose.* Covered with a whitish bloom or powder; as if finely powdered.
*Pubescent.* Covered with short, soft hairs.
*Pulverulent.* Covered as with a powder.
*Punctate.* With minute depressions appearing as dots.
*Punky.* Soft and tough; of the consistency of punk.
*Pyriform.* Pear-shaped, see Illus. II, fig. 37.
*Reflexed portion* (*of the pileus*). The portion turned out to form the pileus. See Illus. I, fig. 3.
*Reniform.* Kidney-shaped. See Illus. II, fig. 35.
*Resupinate.* Closely attached to the substratum throughout the extent of the fruiting body; with neither pileus nor stem. See Illus. I, fig. 4.
*Reticulate.* Covered with a network of interlacing lines or veins or ridges.
*Rigid* (*of the pileus*). Stiff; unbending.
*Rimose.* Cracked; marked with numerous clefts or cracks.
*Rooting* (*of the stem*). Extending into the ground for some distance.
*Rosette.* An imbricate or flower-like cluster.
*Rudimentary.* Incompletely developed; not clearly differentiated.
*Rugose.* Wrinkled; with folds or ridges.
*Scabrous.* Rough with short rigid projections.
*Sclerotium.* A resting body, composed of a hardened mass of hyphae from which fruiting bodies may develop.
*Scrupose.* Rough with minute hard points.
*Separable* (*of the fruiting body*). Capable of being removed from the substratum without difficulty as a sheet; not closely adhering.
*Sessile.* Without a stalk, the pileus attached at the side. See Illus. I, fig. 2.
*Setose.* More or less beset with bristles.
*Sinuous.* Curved, winding.
*Sinuate.* Same as "sinuous."
*Sodden.* Saturated with water.
*Solitary* (*of the pileus*). Occurring singly.
*Spathulate.* Oblong, narrowed at one end; spatula-shaped. See Illus. I, fig. 6.
*Spore.* The reproductive body of a fungus; in the species here described always one celled.
*Squamulose.* Covered with minute scales or squamules.
*Sterigma* (plural *sterigmata*). The spine-like projection from the apex of a basidium, bearing at its tip the spore; usually 4 sterigmata to one basidium. See Illus. II, fig. 30.
*Sterile below.* Said of the under side of the pileus when there is a narrow infertile strip between the margin and the pores. See Illus. I, fig. 11.

*Stipitate.* Stalked, with a stem or stalk. See Illus. I, fig. 1.
*Stratified.* Arranged in layers; in perennial species with the several layers of tubes one above another. See Illus. I, fig. 12.
*Striate.* With radiating or parallel lines or ridges.
*Strigose.* Covered with rough stiff hairs.
*Stuffed (of the pores).* Filled with hyphae.
*Subapplanate.* Somewhat horizontally expanded.
*Subcentral.* Nearly central.
*Subflexuous.* Nearly flexuous; somewhat zigzag or winding.
*Subfusiform (of the spores).* Nearly spindle-shaped; tapering somewhat from the middle to both ends. See Illus. II, fig. 34.
*Subiculum.* The layer of tissue in resupinate forms corresponding to the context in pileate forms. See Illus. I, fig. 4.
*Subpelliculose.* With an indistinct cuticle or thin crust.
*Subsquamulose.* Covered with indistinct scales.
*Substance.* The inner tissue of the stem or pileus.
*Substipitate.* Intermediate between stipitate and sessile, usually expressed by a narrowing of the pileus to form an indistinctly differentiated stem.
*Substratum.* The underlying substance, usually wood, to which the fruiting body is attached. See Illus. I, fig. 4.
*Subulate.* Awl-shaped; broad at the base, tapering to a point. See Illus. II, fig. 26.
*Subunguliform.* Somewhat hoof-shaped.
*Sulcate.* Grooved or furrowed, here used only when concentrically grooved or furrowed.
*Tawny.* A dull orange brown color.
*Terrestrial.* Growing on the ground.
*Thick-walled or thin-walled (of the hyphae).* See Illus. II, figs. 21 and 22.
*Tomentose.* Covered with densely matted wool or hair.
*Trama.* The inner substance of the walls of the tubes; the tissue between adjacent hymenia. See Illus. II, fig. 29.
*Tramal.* Of or pertaining to the trama.
*Truncate.* Abruptly cut off; said of spores when one end appears sharply cut off. See Illus. II, fig. 36.
*Tuber.* As here used same as sclerotium, which see.
*Tubercle.* A short, rounded projection.
*Tubercular (of the surface).* With small rounded projections; nodular.
*Tuberculate (of the spores).* Appearing knobby or warty. See Illus. II, fig. 39.
*Tubes.* The hollow cylindrical or irregularly shaped structures of the pileus which bear the hymenia on their inner walls. See Illus. I, fig. 4.
*Tufted (of the pileus).* Clustered, as if arising from a common point.
*(of the surface).* With small fascicles or clusters of hyphae.
*μ.* Micron.
*Umbilicate.* With a rounded central depression; in the stipitate species usually with a very short stem. See Illus. I, fig. 9.
*Umbo.* An elevation on the surface of the pileus; a knob-like protruberance.
*Umbonate.* Having an umbo.
*Undulate.* Broadly wavy in the vertical direction.
*Unequal (of the mouths).* Of variable size.
*(of the stem).* Not of the same or nearly of the same diameter throughout its length.
*Ungulate.* Hoof-shaped; with the pileus as thick as broad and steep in front. See Illus. I, fig. 12.
*Velvety.* Like velvet; closely and evenly covered with fine, soft hairs.
*Ventricose.* Swelling out or inflated at one side (or in the middle). See Illus. II, fig. 26.
*Vesicle.* An enlarged and apparently empty structure with thin walls.
*Vesicular.* Of or containing vesicles.
*Villous or villose.* Covered with soft weak hairs.
*Volva.* The extension of the tissue of the pileus in *P. volvatus* which covers the pore surface. See Illus. I, fig. 14.
*Woody.* Hard, like wood.
*Zonate.* With zones.

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INDEX TO GENERA AND SPECIES

Generic and sectional names are printed in CAPITALS; generic and specific names of species described in the text, and the page upon which described, in **bold face type**; synonyms, and species discussed in the text, in ordinary type.


abietina (Lenzites) ..... 108
**abietinus** (Coriolus) ..... 62
**(Polyporus)** ..... **62**
(Polystictus) ..... 62
Abietis (Trametes) ..... 119
abortivus (Polyporus) ..... 31
**admirabilis (Polyporus)** .....**24,** 25
adusta (Bjerkandera) .....58, 59
**adustus (Polyporus)** ..... **59**
Aesculi (Daedalea) ..... 103
**albellus (Polyporus)** .....**79,** 80, 87
**albiceps (Polyporus)** ..... **25**
albida (Daedalea ochracea form).. 106
(Lenzites) ..... 104
**albidus (Polyporus)** .....**85,** 86
(Polyporus ochraceus form) ..... 88
**alboluteus** (Aurantiporellus) .... 56
**(Polyporus)** ..... **56**
alutaceus (Polyporus) ..... 84
**alveolaris (Favolus)** .....**90,** 91
(Hexagona) ..... 90
**ambigua (Daedalea)** ..... **103**
Amesii (Polyporus) ..... 86
**amorphus (Polyporus)** ..... **60**
(Tyromyces) ..... 60
amygdalinus (Polyporus) ..... 86
anax (Polyporus) ..... 42
**anceps (Polyporus)** .....**83,** 89
(Tyromyces) ..... 83
**annosus (Fomes)** .....90, **114**
**applanatus (Fomes)** .....**123,** 125
APUS ..... **48**
arculariellus (Polyporus) ..... 36
**arcularius (Polyporus)** ..... **36**
aurantiacus (Polyporus) ..... 56
aureonitens (Polyporus) ..... 52
Bakeri (Fomes) .....120, 121
(Pyropolyporus) ..... 120
Balloui (Polyporus) ..... 32
**balsameus** (Coriolus) ..... 71
**(Polyporus)** ..... 71
(Tyromyces) ..... 71
Beatiei (Polyporus) ..... 42
benzoinus (Polyporus) .....53, 54
**Berkeleyi** (Grifola) ..... 42
**(Polyporus)** ..... **42**
**betulina** (Fomitiporia) ..... 117
**(Lenzites)** .....106, 108
(Poria) ..... 117
**betulinus (Polyporus)** ..... **32**
bicolor (Lenzites) ..... 104
**biformis** (Coriolus) .....64, 87
**(Polyporus)** .....**64,** 88
**borealis (Polyporus)** .....**75,** 87
(Spongipellis) ..... 75
boucheanus (Polyporus) ..... 91
brevipes (Polyporus elegans var.). 26
**brumalis (Polyporus)** .....**36,** 88
**caeruleoporus (Polyporus)** ..... **38**
(Scutiger) ..... 38
caesarius (Polyporus) ..... 87
caesiosimulans (Polyporus) ....80, 81
(Tyromyces) ....80, 81
**caesius (Polyporus)** .....**80,** 81
(Tyromyces) ..... 80
calceolus (Polyporus) ..... 25
callosa (Poria) ..... 101
canadensis (Favolus) .....90, 91
candidus (Polyporus epileucus var.) 85
carnea (Fomes) ..... 96
(Trametes) .....96, 97
**carbonaria** (Hexagona) ..... 99
**(Trametes)** ..... **99**
carneiporus (Polyporus versicolor var.) ..... 65
carolinensis (Polyporus) ..... 87
carpineus (Polyporus) ..... 59
casearius (Polyporus) ..... 87
caudicinus (Polyporus) ..... 29
cerifluus (Polyporus) ..... 87
cervina (Trametes) ..... 98
chioneus (Polyporus) .....79, 80, 87
(Tyromyces) ..... 79
cinerea (Daedalea) ..... 104
cinnabarina (Trametes) ..... 55
**cinnabarinus (Polyporus)** ..... **55**
(Pycnoporus) ..... 55
cinnamomea (Coltrichia) ..... 45
**cinnamomeus (Polyporus)**45, 88, 89
(Polystictus) ..... 45
circinans (Polyporus) ..... 87
**circinatus (Polyporus)** ...**47, 48,** 87
**compactus (Polyporus)** ..... **78**
**conchatus (Fomes)** ....**118,** 119, 124
(Pyropolyporus) ..... 118
**conchifer (Polyporus)** ..... **68**
(Polystictus) ..... 68
(Poronidulus) ..... 68
conchoides (Gloeoporus) ..... 61
concolor (Daedalea) ..... 104
**confluens (Polyporus)** ..... **39**
**confragosa (Daedalea)** .....**103,** 104
105, 106
(Lenzites) ..... 105
(Trametes) ..... 105
conglomeratus (Polyporus) ..... 87

**connatus (Fomes)**...87, 90, **113,** 124
(Polyporus)..... 87
(Polystictus)..... 87
corruscans (Polyporus)..... 50
Crataegi (Lenzites)..... 105
crispellus (Polyporus)..... 71
(Tyromyces)..... 71
**crispus (Polyporus)**..... **58**
cristata (Grifola)..... 39
**cristatus (Polyporus)**..... **39**
**croceus** (Aurantiporus)..... 57
**(Polyporus)**.....**57,** 77
cupulaeformis (Polyporus)..... 34
**Curtisii (Ganoderma)**.....**126,** 127
(Polyporus)..... 126
**cuticularis** (Inonotus)..... 50
**(Polyporus)**.....**50,** 88
(Polystictus)..... 46
CYCLOMYCES..... **109**
DAEDALEA....15, 91, **101,** 106, 109
dealbatus (Polyporus)..... 87
deformatis (Polyporus parvulus var.)..... 45
**delectans (Polyporus)**.....**76,** 88
(Spongipellis)..... 76
**densus (Fomes)**..... **119**
dentifera (Lenzites sepiaria var.).. 56
**dependens** (Coltrichiella)..... 43
**(Polyporus)**..... **43**
(Polystictus)..... 43
destructor (Polyporus)..... 87
**dichrous** (Gloeoporus)..... 61
**(Polyporus)**.....**61,** 88
**distortus** (Abortiporus)..... 31
**(Polyporus)**....**31,** 32, 87
**dryadeus** (Ionotus)..... 51
**(Polyporus)**..... **51**
dryophilus (Inonotus)..... 50
(Polyporus).....50, 51
**dualis (Polyporus)**..... **48**
(Polyporus circinatus var). 48
**elegans (Polyporus)**.....25, **26**
elongatus (Polyporus)..... 88
**epileucus (Polyporus)**.....**78,** 85
europaeus (Favolus).....90, 91
**Everhartii (Fomes)**..... **122**
(Pyropolyporus)..... 122
exaculeata (Poria laevigata var.).. 124
extensa (Daedalea)..... 105
**fagicola (Polyporus)**..... **30**
FAVOLUS.....15, **90**
**fibrillosus** (Inonotus)..... 56
**(Polyporus)**..... **56**
(Pycnoporellus)..... 56
fibula (Polyporus)..... 88
**fissilis (Polyporus)**.....57, 77
(Spongipellis)..... 77
fissus (Polyporus)..... 27
flaccida (Lenzites)..... 108
flavidus (Polyporus)..... 35
flavovirens (Grifola)..... 39
(Polyporus).....39, 40
**floriformis (Polyporus)**.....**70,** 71
**focicola** (Coltrichia)..... **45**
**(Polyporus)**.....**45,** 87, 88
fomentaria (Elfvingia)..... 120
(Elfvingiella)..... 120
**fomentarius (Fomes)**.....**117, 120**
FOMES.....**91, 109**
fractipes (Grifola)..... 35
**fragilis (Polyporus)**.....**82,** 90
(Spongipellis)..... 82
fragrans (Bjerkandera)..... 60
(Polyporus)..... 60
**fraxineus (Fomes)**..... **115**
**fraxinophilus (Fomes)**..... **112**
(Polyporus)..... 112
frondosa (Grifola)..... 41
**frondosus (Polyporus)**.....**41,** 88
fuliginosa (Ishnoderma)..... 53
fulvus (Fomes)..... 118
(Pyropolyporus)..... 118
**fumidiceps (Polyporus)**....**72,** 80
(Tyromyces)..... 72
fumosa (Bjerkandera)..... 60
(Daedalea unicolor var.)..104
**fumosus (Polyporus)**..... **60,** 86
88, 89
fuscus (Polyporus).....53, 54
**galactinus (Polyporus)**.....**72,** 73
74, 87, 88
(Spongipellis)....73, 86
GANODERMA..... **125**
geotropus (Fomes)..... 124
gigantea (Grifola)..... 41
**giganteus (Polyporus)**..... **41**
**gilvus** (Hapalopilus)..... 52
**(Polyporus)**.....**52,** 89
glaberrima (Daedalea)..... 103
GLOEOPORUS..... 61
**glomeratus** (Inonotus)..... 49
**(Polyporus)**..**49,** 87, 89
granularis (Fomes carnea var.)... 96
**graveolens** (Fomes)..... 54
(Globifomes)..... 54
**(Polyporus)**..... **54**
Grayii (Polyporus).....67, 88
**Greenei (Cyclomyces)**..... **109**
(Cycloporus)..... 109
**griseus (Polyporus)**..... **37**
(Scutiger)..... 37
**guttulatus (Polyporus)**..... **84**
(Tyromyces)..... 84
Hartigii (Fomes)..... 124
**heteromorpha** (Lenzites)..... 94
(Polystictus)..... 94
**(Trametes)**..93, **94**
hexagoniformis (Coriolus)..... 94
(Trametes)..... 94
hirsutellus (Polystictus)..... 88
**hirsutulus** (Coriolus)..... 65
**(Polyporus)**.....**65,** 88
hirsutum (Gloeophyllum)....100, 108
**hirsutus** (Inonotus)..... **49**
**(Polyporus)**.....**66,** 88
(Polystictus)..... 66

**hirtus (Polyporus)** ..... 33
**hispida (Trametes)** ..... **97**, 101
hispidellus (Polyporus) ..... 33
(Scutiger) ..... 33
hispidoides (Polyporus) ..... 46
**hispidus (Polyporus)** ..... 49
Holmiensis (Polyporus) ..... 60, 88
**humilis (Polyporus)** ..... **31**
hydnoides (Trametes) ..... 101
hypococcinus (Polyporus) ..... 57
**igniarius (Fomes)** ..... **116**, 117, 118
124
(Pyropolyporus) ..... 116
**immitis (Polyporus)** ..... **86**, 88
imperfectus (Polyporus zonatus var.) ..... 66
interruptus (Polyporus variiformis var.) ..... 93
intybaceus (Polyporus) ..... 88
**iowensis (Polyporus)** ..... 73
irpiciformis (Polyporus abietinus var.) ..... 62
isabellina (Phellinus) ..... 101
(Trametes) ..... 101
**juniperina (Daedalea)** ..... **102**
Klotzschii (Lenzites) ..... 105
Kmetii (Trametes) ..... 69
labyrinthicus (Polyporus) ..... 88
laceratus (Polyporus) ..... 88
**lacteus** (Irpiciporus) ..... 64
**(Polyporus)** ..... **79**, 80, 85
(Tyromyces) ..... 79
**laevigatus (Fomes igniarius** var. ..... 117
(Fomes) ..... 117
lapponicus (Polyporus) ..... 83
Laricis (Fomes) ..... 115
LENTUS ..... 35
LENZITES ..... 15, 91, 102, **106**
leporinus (Polyporus) ..... 48
leucomelas (Polyporus) ..... 37
leucophaeus (Fomes) ..... 123
lipsiensis (Ganoderma) ..... 123
Lloydii (Polystictus) ..... 88
lobata (Elfvingia) ..... 123
**lobatus (Fomes)** ..... **123**, 125
**lucidum (Ganoderma)** ..... **125**, 127
lucidus (Polyporus) ..... 125
ludovicianus (Polyporus) ..... 88
luridus (Polyporus) ..... 88
maculatus (Polyporus) ..... 84
**malicola** (Coriolellus) ..... 98
(Polyporus) ..... 73
**(Polyporus spumeus** var.) ..... 72, 73
**(Trametes)** ..... **98**
marginatus (Fomes) ..... 114
(Polyporus) ..... 113
megaloma (Elfvingia) ..... 123
(Fomes) ..... 123
MELANOPUS ..... **24**
**melanopus (Polyporus)** ..... 27
**merisma (Trametes)** ..... 91, **95**
MERISMUS ..... **40**
MERULIUS ..... 14
mesenterica (Grifola) ..... 41
metallicus (Polyporus) ..... 125
micropora (Hexagona) ..... 90
microporus (Favolus) ..... 90, 91
minima (Trametes) ..... 94
**mollis** (Antrodia) ..... 98
**(Polyporus)** ..... **81**, 90
**(Trametes)** ..... 69, 89, 93, **98**, 99
105
molliusculis (Coriolus) ..... 64, 88
(Polystictus) ..... 88
**Montagnei** (Coltrichia) ..... 46
**(Polyporus)** ..... **46**
**Morgani** (Polyporus) ..... 28
**(Trametes)** ..... **97**, 101
nidulans (Polyporus) ..... 53
nigricans (Fomes) ..... 116, 117, 124
nigromarginatus (Coriolus) ..... 66
nigropurpurascens (Polyporus) ... 88
nigropurpurea (Polyporus) ..... 88
niveus (Polyporus) ..... 88
nodulosus (Polyporus variiformis var.) ..... 93
Novae-Angliae (Fomes) ..... 124
obducens (Poria) ..... 124
obesa (Coltrichia) ..... 46
obesus (Polystictus) ..... 46
oblectans (Polystictus) ..... 88
**obtusus (Polyporus)** ..... **76**, 88
obvolutus (Polyporus volvatus var.) ..... 57
ochracea (Daedalea) ..... 104, 106
ochraceus (Polyporus) ..... 88
occidentalis (Spongipellis) ..... 73
**odorata (Trametes)** ..... **100**, 108
Oerstedii (Polyporus) ..... 88
**officinalis (Fomes)** ..... **115**
**ohiensis (Fomes)** ..... **111**
(Trametes) ..... 111
**osseus (Polyporus)** ..... **33**, 88
OVINUS ..... 14, 37
**ovinus (Polyporus)** ..... **38**, 39
(Scutiger) ..... 38
pallidus (Polyporus) ..... 30
**palustris (Polyporus)** ..... **83**
(Tyromyces) ..... 83
papyracea (Poria) ..... 101
**pargamenus (Polyporus)** ... **63**, 87
88, 89
(Polystictus) ..... 63
parvulus (Polyporus) ..... 45, 88
**Peckianus (Polyporus)** ..... **35**
(Polystictus) ..... 35
Peckii (Trametes) ..... **97**, 98
PELLOPORUS ..... **43**
pendulus (Porodisculus) ..... **34**
(Porodiscus) ..... 34
**pennsylvanicus (Polyporus)** . **29**, 30
pergamenus (Polystictus) ..... 63

**perennis** (Coltrichia) ..... 44
(**Polyporus**) .....**44**, 87
(Polystictus) ..... 44
perplexus (Inonotus) ..... 50
(Polyporus) ..... 88
PETALOIDES ..... **32**
piceina (Trametes) ..... 119
piceinus (Polyporus) ..... 119
(Polystictus) ..... 119
**picipes** (**Polyporus**) .....26, **27**, 28
Pilotae (Aurantiporus) ..... 57
(Polyporus) ..... 57
**Pini** (**Fomes**) ..... **119**
(Porodaedalea) ..... 119
(Trametes) ..... 119
**pinicola** (**Fomes**) ..... **113**
**planellus** (Coriolus) ..... 68
(**Polyporus**) ..... **68**, 69
planus (Polyporus) ..... 68
plumbea (Daedalea) ..... 106
**pocula** (**Polyporus**) ..... **34**
polycephalus (Polystictus cinnamomeus var.) ..... 89
POLYPORUS.....**15**, 90, 91, 102, 109
Polyporus (Polyporus) ..... 36
**pomaceus** (**Fomes**) ..... **118**
populinus (Fomes) ..... 113
PORIA ..... 14
poripes (Grifola) ..... 39
porosa (Lenzites sepiaria var.) ..... 108
proliferus (Polyporus circinatus var.) ..... 47
prolificans (Coriolus) ..... 63
protracta (Lenzites) ..... 108
(Trametes) .....100, 108
pseudoboletum (Ganoderma) .126, 127
pseudopargamenus (Polyporus)... 89
puberula (Bjerkandera) ..... 60
**pubescens** (Coriolus) ..... 67
(**Polyporus**) ...**67**, 88, 90
**pusilla** (**Trametes**) ..... **95**
**quercina** (**Daedalea**) ..**102**, 103, 106
(Trametes) ..... 101
radiata (Lenzites betulina var.)... 106
**radiatus** (Inonotus) .....49, 52
(**Polyporus**) ..... **52**
**radicatus** (**Polyporus**) ..... **28**
(Scutiger) ..... 28
ramosissima (Cladomeris) ..... 40
(Grifola) ..... 40
reniformis (Elfvingia) ..... 123
**resinosus** (**Polyporus**) .....**53**, 89
resupinata (Trametes serialis var.) 92
resupinatus (Polyporus variiformis var.) ..... 93
**Rheades** (**Polyporus**) ..... **50**
**rhipidium** (Favolus) ..... 61
(**Polyporus**) ..... **61**
**Ribis** (**Fomes**) ..... **121**
(Pyropolyporus) ..... 121
rigens (Polystictus) ..... 89
rigida (Coriolopsis) ..... 97
(Funalia) ..... 97
(Trametes) .....89, 97, 101
**rimosus** (**Fomes**) ..... **122**
Robineae (Fulvifomes) ..... 122
(Pyropolyporus) ..... 122
robiniophila (Trametes) ..... 74
**robiniophilus** (**Polyporus**) ..... **74**
**robustus** (**Fomes**) .....**120**, 124
**roseus** (**Fomes**) ..... **116**
Rostkowii (Polyporus) ..... 30
rubescens (Trametes) ..... 103
rubiginosus (Polyporus) ..... 89
rufescens (Polyporus) .....31, 32
rufozonata (Lenzites betulina var.) 106
**rutilans** (Hapalopilus) ..... 53
(**Polyporus**) .... **53**, 88, 124
**saepiaria** (**Lenzites**) ..... **108**
salicinus (Fomes) ..... 124
salignus (Polyporus) ..... 89
**sanguineus** (**Polyporus**) ..... **55**
(Pycnoporus) ..... 55
Sartwellii (Polyporus) ..... 89
**Schweinitzii** (**Polyporus**) ..... **46**
scruposus (Polyporus) ..... 89
(Polyporus tephroleucus var.) ..... 80
**scutellatus** (**Fomes**) ..... **111**
(Polyporus) ..... 111
(Trametes) ..... 111
semialbinus (Polyporus sulphureus var.) ..... 42
**semipileatus** (**Polyporus**) ...**78**, 90
(Tyromyces) ..... 78
**semisupinus** (**Polyporus**) ...**70**, 78
79, 90
(Tyromyces) ..... 70
**sepium** (Coriolellus) ..... 94
(**Trametes**) .....**94**, 98
Sequoiae (Coriolellus) ..... 99
(Trametes) ..... 99
**serialis** (Coriolellus) ..... 92
(**Trametes**) .....**92**, 101, 105
serpens (Trametes) ..... 101
**sessile** (**Ganoderma**) .....88, **127**
sessilis (Polyporus) .....88, 127
setigera (Poria) ..... 89
setosus (Trametes) ..... 100
simillimus (Polyporus) ..... 44
sinuosa (Poria) ..... 89
sinuosus (Polyporus) ..... 89
sistotremoides (Phaeolus) ..... 46
SOLENIA ..... 14
speciosus (Laetiporus) ..... 42
splendens (Polyporus) ..... 45
SPONGIOSUS (WHITE) ..... **30**
(BROWN) ..... **46**
**Spraguei** (**Polyporus**) ..... **74**
(Tyromyces) ..... 74
**spumeus** (**Polyporus**) ..... **73**
**squamosus** (**Polyporus**) ....**29**, 30
Stephensii (Polyporus) ..... 101
(Trametes) ..... 101
stereoides (Trametes) ..... 99
stipticus (Polyporus) ..... 89
striata (Lenzites) ..... 108
striatula (Hexagona) ..... 90

stuppea (Funalia) ..... 97
**suaveolens (Trametes)** ..... **96**
suberosus (Piptoporus) ..... 32
subflavus (Polyporus) ..... 89
subfuscus (Polyporus) ..... 89
**subpendulus (Polyporus)** ..... 34
(Tyromyces) ..... 34
subpileatus (Polyporus) ..... 90
subradicatus (Scutiger) .....27, 28
**subrosea (Trametes)** .....**96,** 116
subsericeus (Polyporus) ..... 45
subsquamosus (Polyporus) ..... 37
subzonata (Fomes carnea var.) ... 96
Sullivantii (Polyporus) ..... 90
sulphurella (Daedalea) ..... 106
**sulphureus** (Laetiporus) ..... 42
**(Polyporus)** .....**42,** 87
Sumstinei (Grifola) ..... 41
superficialis (Poria) ..... 100
**tenuis** (Fomes) .....100, 101
**(Trametes)** .....**100,** 101
**tephroleucus (Polyporus)** ...71, 79
**80**
tomentosa (Coltrichia) ..... 47
tomentosus (Polyporus) ..... 47
**trabea (Lenzites)** .....**107,** 108
(Trametes) ..... 108
trabeum (Gloeophyllum) ..... 107
**trabeus (Polyporus)** .. 79, 80, **84,** 85
TRAMETES .....15, **91,** 102, 109
tricolor (Lenzites) ..... 106
Trogii (Trametes) ..... 101
tropicalis (Polyporus) ..... 32
Tsugae (Ganoderma) ..... 125
(Polyporus) .....125, 126
tulipifera (Irpex) ..... 64
Tulipiferae (Irpiciporus) ..... 64
**tulipiferus (Polyporus)** .....14, **64**
typicus (Polyporus volvatus var.). **57**
ulmarius (Fomes) ..... 124
(Polyporus) ..... 124
**umbellatus (Polyporus)** ..... **40**
Underwoodii (Polyporus) ..... 24
**undosus (Polyporus)** ..... **69**
(Tyromyces) ..... 69
ungulatus (Fomes) .....113, 114
**unicolor** (Cerrena) ..... 104
**(Daedalea)** ... 89, 102, **104**
106
(Spongipellis) ..... 76
(Trametes) ..... 76
**ursinus (Polyporus)** .....**82,** 90
Valenzuelianus (Polyporus) ..... 90
**variiformis** (Coriolellus) ..... 93
(Polyporus) ..... 93
**(Trametes)** ..**93,** 94, 99
101
**varius (Polyporus)** .....**25,** 26
velutina (Lenzites) ..... 108
velutinus (Polyporus) .....67, 68
velutipes (Polyporus Morgani var.) 28
**versicolor** (Coriolus) ..... 65
**(Polyporus)** .....**65,** 66
(Polystictus) ..... 65
vialis (Lenzites) ..... 107
virgineus (Polyporus) ..... 68
viticola (Poria) ..... 100
**volvatus** (Cryptoporus) ..... 57
**(Polyporus)** ..... **57**
Weinmanni (Polyporus) ..... 90
Whiteae (Scutiger) ..... 39
xanthopora (Poria) ..... 50
**zonatus** (Coriolus) ..... 66
**(Polyporus)** ..... **66**
(Polystictus) ..... 66

SYNOPTICAL ARRANGEMENT OF THE GENERA AND SPECIES

* *Spores smooth, or, if echinulate, globose; pileus not laccate (except 142. Fomes lobatus; and 143. F. applanatus)*

§ *Fruiting body typically annual*

× *Trama usually not continuous with the context*

† *Pores circular to angular, or, if radially elongated, the pileus with a central stem*

## 1. POLYPORUS

Section I. Fruiting body typically stipitate or substipitate

Subsection 1. Context white or whitish, at least when fresh

Series 1. Stem usually black at the base or black throughout

I. Pores 3–8 per mm.; spores 2–4 $\mu$ wide

A. Surface of pileus white or whitish

*1. P. admirabilis*
*2. P. albiceps*

B. Surface of pileus yellowish to dark brown

*3. P. varius*
*4. P. elegans*
*5. P. picipes*
*6. P. melanopus*

II. Pores 2–3 per mm. or larger; spores 4–8 $\mu$ wide

*7. P. radicatus*
*8. P. squamosus*
*8a. P. pennsylvanicus*
*8b. P. fagicola*

Series 2. Stem not black at the base nor black throughout, white or variously colored, more or less concolorous throughout

I. Stem unbranched, or rarely branching once or twice

A. Context duplex, firm below, spongy above

*9. P. humilis*
*10. P. distortus*

B. Context homogeneous

1. Stem lateral, or pilei pendant

a. Context 0.3–3.5 cm. thick; stem usually lateral

*12. P. betulinus*
*13. P. osseus*
*14. P. hirtus*

b. Context 0.5–2 mm. thick; pilei usually pendant (compare also laterally stipitate 59. *P. rhipidium*)

*15. P. pocula*
*16. P. subpendulus*

2. Stem central to excentric, rarely truly lateral

a. Pilei when fresh more or less coriaceous or fleshy-tough; usually epixylous

*17. P. Peckianus*
*18. P. arcularius*
*19. P. brumalis*

b. Pilei when fresh fleshy to firm-fleshy; terrestrial

*20. P. griseus*
*21. P. caeruleoporus*
*22. P. ovinus*
*23. P. confluens*
*24. P. cristatus*

II. Stem few to many times branched, with few large or many small pilei

*25. P. umbellatus*
*26. P. frondosus*
*27. P. giganteus*
*28. P. Berkeleyi*
*29. P. sulphureus*

Subsection 2. Context usually yellowish brown or darker, at least when dry

Series 1. Spores brown; cystidia or setae absent

I. Fruiting body pendant

*30. P. dependens*

II. Fruiting body upright

*31. P. perennis*
*32. P. cinnamomeus*
*33. P. focicola*
*34. P. Montagnei*

Series 2. Spores hyaline; cystidia or setae present

*35. P. Schweinitzii*
*36. P. circinatus*
*37. P. dualis*

Section II. Fruiting body sessile or effused-reflexed, rarely resupinate or substipitate (except laterally stipitate 59. *P. rhipidium*)

Subsection 1. Context light brown to dark brown; spores hyaline or colored

Series 1. Spores colored, greenish yellow or brownish

*38. P. hispidus*
*39. P. glomeratus*
*40. P. cuticularis*
*41. P. Rheades*

Series 2. Spores hyaline or nearly so

I. Setae present

*42. P. dryadeus*
*43. P. gilvus*
*44. P. radiatus*

II. Setae absent

*45. P. rutilans*
*46. P. resinosus*
*47. P. graveolens*

Subsection 2. Context reddish, orange, pinkish, or yellowish; spores hyaline

*48. P. sanguineus*
*49. P. cinnabarinus*
*50. P. fibrillosus*
*51. P. alboluteus*
*52. P. croceus*

Subsection 3. Context white or whitish when fresh, rarely light brown; spores hyaline (except bluish-gray in 89. *P. caesius*)

Series 1. Pore surface surrounded by a volva

*53. P. volvatus*

Series 2. Pore surface never surrounded by a volva, entirely free from the first

I. Tubes usually of a markedly different color or consistency than the context

A. Tubes usually more or less smoke colored to almost black, at least when dry

*54. P. crispus*
*55. P. adustus*
*56. P. fumosus*

B. Tubes whitish to reddish or orange or purplish, more or less waxy when fresh

*57. P. amorphus*
*58. P. dichrous*
*59. P. rhipidium*

II. Tubes more or less of the same color and consistency as the context, at least when fresh

A. Fruiting body more or less coriaceous when fresh; context rarely over 5 mm. thick and usually much thinner; spores cylindrical to ellipsoid, or allantoid

1. Dissepiments usually soon splitting, becoming tooth-like

*60. P. abietinus*
*61. P. pargamenus*
*62. P. tulipiferus*
*63. P. biformis*

2. Dissepiments not splitting, the edges of the mouths entire to lacerate

a. Surface of the pileus hirsute to tomentose or velvety

*64. P. hirsutulus*
*65. P. versicolor*
*66. P. zonatus*
*67. P. hirsutus*
*68. P. pubescens*

b. Surface of the pileus finely tomentose to glabrous

*69. P. conchifer*
*70. P. planellus*

B. Fruiting body subcoriaceous to fleshy-tough when fresh; context 0.5–3 mm. thick

1. Spores allantoid

*71. P. undosus*

2. Spores ellipsoid to ovoid

*72. P. semisupinus*
*73. P. floriformis*
*74. P. balsameus*

C. Fruiting body soft and watery when fresh, the context usually 2–5 mm. or more thick, or, if fleshy-tough to corky or subcoriaceous, the context usually thick

1. Spores ellipsoid to subglobose

a. Pores small, 2–6 per mm.

(1) Spores 2.5–4.5 $\mu$ long

*75. P. fumidiceps*
*76. P. galactinus*

(2) Spores 4.5–7 $\mu$ or more long

*77. P. spumeus*
*77a. P. spumeus var. malicola*
*78. P. Spraguei*
*79. P. robiniophilus*

b. Pores usually 1–2 per mm. or larger

*80. P. borealis*
*81. P. delectans*
*82. P. obtusus*
*83. P. fissilis*

2. Spores reniform

*84. P. epileucus*

3. Spores allantoid or cylindrical to cylindric-ellipsoid

a. Spores allantoid, or at least slightly curved; pileus when fresh unchanging or turning bluish where bruised

*85. P. semipileatus*
*86. P. albellus*
*87. P. lacteus*
*88. P. tephroleucus*
*89. P. caesius*

b. Spores allantoid or cylindrical to cylindric-ellipsoid; pileus when fresh turning reddish or brownish where bruised, or changing on drying

*90. P. mollis*
*91. P. fragilis*
*92. P. ursinus*

c. Spores cylindrical to subellipsoid; pileus when fresh unchanging where bruised

(1) Spores 6–9 $\mu$ long

*93. P. anceps*
*94. P. palustris*

(2) Spores 3–6 $\mu$ long

*95. P. guttulatus*
*96. P. trabeus*
*97. P. albidus*
*98. P. immitis*

†† *Pores radially elongated; pileus with a lateral stem*

### 2. FAVOLUS

*99. F. alveolaris*

×× *Trama more or less continuous with the context*
† *Pore surface typically poroid*

### 3. TRAMETES

I. Context white, whitish, or buff
A. Surface of the pileus brown

*100. T. serialis*
*101. T. variiformis*

B. Surface of pileus white, whitish, buff, or grayish (compare also 108. *T. Morgani*)

*102. T. heteromorpha*
*103. T. sepium*
*104. T. merisma*
*105. T. pusilla*
*106. T. suaveolens*

II. Context pinkish to rose colored

*107. T. subrosea*

III. Context light brown

*108. T. Morgani*
*109. T. hispida*
*110. T. malicola*
*111. T. mollis*

IV. Context yellowish brown or darker

*112. T. carbonaria*
*113. T. odorata*
*114. T. tenuis*

†† *Pore surface typically daedaloid*

### 4. DAEDALEA

*115. D. quercina*
*116. D. juniperina*
*117. D. confragosa*
*118. D. ambigua*
*119. D. unicolor*

††† *Pore surface typically lamellate*
*α Lamellae radially arranged*

### 5. LENZITES

*120. L. betulina*
*121. L. trabea*
*122. L. saepiaria*

*β Lamellae concentrically arranged*

### 6. CYCLOMYCES

*123. C. Greenii*

§§ *Fruiting body typically perennial*

### 7. FOMES

I. Context white to light brown
  A. Fruiting body small, not over 2.5 cm. broad
    *124. F. scutellatus*
    *125. F. ohiensis*
  B. Fruiting body usually much larger, more than 2.5 cm. broad
    1. On the wood of deciduous trees
      *126. F. fraxinophilus*
      *127. F. connatus*
    2. Usually on the wood of coniferous trees
      *128. F. pinicola*
      *129. F. annosus*
      *130. F. officinalis*
II. Context flesh colored to rose colored, at least when fresh
    *131. F. fraxineus*
    *132. F. roseus*
III. Context yellowish brown or darker
  A. Spores hyaline
    1. Setae present
      *133. F. igniarius*
      *133a. F. igniarius var. laevigatus*
      *134. F. pomaceus*
      *135. F. conchatus*
      *136. F. Pini*
    2. Setae absent
      *137. F. fomentarius*
      *138. F. robustus*
  B. Spores brown
    1. Context duplex; setae none; spores smooth
      *139. F. Ribis*
    2. Context homogeneous, woody; setae present or absent; spores smooth (See also 136. *F. Pini*)
      *140. F. Everhartii*
      *141. F. rimosus*
    3. Context homogeneous, soft and punky; setae none; spores appearing echinulate
      *142. F. lobatus*
      *143. F. applanatus*

** *Spores appearing echinulate, usually truncate at one end; pileus laccate (compare also 142. Fomes lobatus; and 143. F. applanatus)*

### 8. GANODERMA

*144. G. lucidum*
*145. G. Curtisii*
*146. G. sessile*